# MELSEC System Q

Programmable Logic Controllers

User's Manual

# QJ61BT11N
# CC-Link Master/Lokal Module

Art. no.: 158161
01 07 2005
SH (NA)-080394E
Version D

# • SAFETY PRECAUTIONS •

(Always read these precautions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product. For the safety precautions of the programmable controller system, please read the user's manual of the CPU module to use.
In this manual, the safety precautions are ranked as "DANGER" and "CAUTION".

| | |
|---|---|
| ⚠ DANGER | Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury. |
| ⚠ CAUTION | Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage. |

Note that the ⚠CAUTION level may lead to a serious consequence according to the circumstances. Always follow the precautions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

## [DESIGN PRECAUTION]

### ⚠ DANGER

- See Chapter 5 of this manual for each station's operating status when there is a communication error in the data link.
- When performing the control of the PLC in operation (changing data) by connecting a personal computer, etc. to the intelligent function module or connecting peripheral devices to the CPU module, configure an interlock circuit in a sequence program so the safety of the overall system is always maintained.
  Before performing other controls of the PLC in operation (changing program and operation status (status control)), read this manual carefully and confirm if the overall safety is maintained. Especially, when this control is performed to a remote PC from an external device, troubles that have occurred on the PLC side may not be able to immediately be handled if there is a data communication error.
  Define a troubleshooting agreement between external devices and the PLC CPU for data communication error occurrences, as well as construct an interlock circuit in the sequence program.


A - 1

## [DESIGN PRECAUTION]

### ⚠ DANGER

- Do not write data into the "system area" of the buffer memory of intelligent function modules.
  Also, do not output the "prohibited to use" signal as the output signal to an intelligent function module from the PLC CPU.
  Writing data into the "system area" or outputting a signal for "prohibited to use" may cause system malfunction in the PLC.
- To specify the automatic refresh parameter, specify "Y" for the remote output RY refresh device.
  If a value other than "Y" (for example, M or L) is specified, the status of the device will remain as it was prior to the STOP operation when the CPU is stopped.
  See Section 4.4.10 for how to stop the data link.
- If wire breakage occurs in the CC-Link dedicated cable, the line may become instable, resulting in a data link communication error at multiple stations. Configure an interlock circuit in a sequence program to operate the system toward the safety side if a data link communication error occurs at multiple stations. Failure to do so may result in an accident due to false output or malfunction.

## [DESIGN PRECAUTION]

### ⚠ CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100mm(3.9inch) or more from each other.
  Not doing so could result in noise that may cause malfunction.

## [INSTALLATION PRECAUTIONS]

### ⚠ CAUTION

- Use the PLC in an environment that meets the general specifications contained in the CPU user's manual to use.
  Using this PLC in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.
- While pressing the installation lever located at the bottom of module, insert the module fixing tab into the fixing hole in the base unit until it stops. Then, securely mount the module with the fixing hole as a supporting point.
  Improper installation may result in malfunction, breakdown or dropping out of the module.
  Securely fix the module with screws if it is subject to vibration during use.
- Tighten the screws within the range of specified torque.
  If the screws are loose, it may cause fallout, short circuits, or malfunction.
  If the screws are tightened too much, it may cause damage to the screw and/or the module, resulting in fallout, short circuits or malfunction.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.
  Not doing so may cause damage to the module.
- Do not directly touch the conductive area or electronic components of the module.
  Doing so may cause malfunction or failure in the module.

## [WIRING PRECAUTIONS]

### ⚠ CAUTION

- When turning on the power and operating the module after installing is completed, always attach the terminal cover that comes with the product.
  There is a risk of malfunction if the terminal cover is not attached.
- Tighten the terminal screws within the range of specified torque.
  If the terminal screws are loose, it may cause short circuits, or malfunction.
  If the terminal screws are tightened too much, it may cause damage to the screw and/or the module, resulting in fallout, short circuits or malfunction.
- Be careful not to let foreign matters such as sawdust or wire chips get inside the module.
  These may cause fires, failure or malfunction.
- The top surface of the module is covered with protective film to prevent foreign objects such as cable offcuts from entering the module when wiring.
  Do not remove this film until the wiring is complete.
  Before operating the system, be sure to remove the film to provide adequate heat ventilation.
- Use a dedicated cable as specified by the manufacturer for the CC-Link system. If a cable other than the one specified by the manufacturer is used, the performance of the CC-Link system cannot be guaranteed. Also, follow the specifications listed in Chapter 3 for the overall cable distance and the station-to-station cable length. If wiring is done other than as specified, accurate transmission of data cannot be guaranteed.
- Be sure to fix communication cables or power supply cables leading from the module by placing them in the duct or clamping them.
  Cables not placed in the duct or without clamping may hang or shift, allowing them to be accidentally pulled, which may cause a module malfunction and cable damage.
- Do not install the control lines together with the communication cables, or bring them close to each other. Failure to do so may cause malfunctions due to noise.
- Be sure to fix the wires or cables by ducts or clamps when connecting them to the module.
  When removing the cable with a connector, hold the connector on the side that is connected to the module.
  When removing the cable connected to the terminal block, first loosen the screws on the part that is connected to the terminal block.
  Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.


A - 3

## [STARTING AND MAINTENANCE PRECAUTIONS]

| ⚠ CAUTION |
|---|
| • Do not disassemble or modify each module.<br>Doing so could cause failure, malfunction, injury or fire.<br>• Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.<br>Not doing so may cause failure or malfunction of the module.<br>• Do not touch the connector while the power is on.<br>Doing so may cause malfunction.<br>• Be sure to shut off all phases of the external power supply before cleaning or retightening the terminal screws or module fixing screws.<br>Not doing so may cause failure or malfunction of the module.<br>If the screws are loose, it may cause fallout, short circuits, or malfunction.<br>If the screws are tightened too much, it may cause damages to the screws and/or the module, resulting in fallout, short circuits or malfunction.<br>Do not mount/remove the module onto/from the base unit more than 50 times (IEC 61131-2-compliant), after the first use of the product. Failure to do so may cause malfunction.<br>• Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the module.<br>Failure to do so may cause a failure or malfunctions of the module. |

## [DISPOSAL PRECAUTIONS]

| ⚠ CAUTION |
|---|
| • When disposing of this product, treat it as industrial waste. |

REVISIONS

* The manual number is given on the bottom left of the back cover.

| Print Date | * Manual Number | Revision |
|---|---|---|
| May, 2003 | SH (NA)-080394E-A | First edition |
| May, 2004 | SH (NA)-080394E-B | Addition<br>Appendix 6<br>Partial correction<br>SAFETY PRECAUTIONS, Section 2.2.1, Section 2.2.3, Section 2.2.4, Chapter 4, Section 4.1, Section 4.3.3, Section 4.4.14, Section 7.2.1, Section 8.2.2, Section 8.3.1, Section 8.3.2, Section 8.4.1, Section 8.4.2, Section 13.1, Section 13.3, Appendix 3 |
| Dec., 2004 | SH (NA)-080394E-C | Partial correction<br>SAFETY PRECAUTIONS, Chapter 1, Section 2.2.1, Section 3.1, Section 4.4.1, Section 4.4.2, Section 4.4.3, Section 4.4.14, Section 5.4.1, Section 7.3, Section 8.4.2, Section 13.3, Appendix 2, Appendix 2.3, Appendix 2.4, Appendix 2.5, Appendix 2.6, Appendix 2.7 |
| Jul., 2005 | SH (NA)-080394E-D | Addition<br>Section 11.1<br>Partial correction<br>SAFETY PRECAUTIONS, Section 2.2.1, Section 2.2.2, Section 4.4.3, Section 4.4.6, Section 6.2, Section 6.3.1, Section 6.3.2, Section 6.4.1, Section 6.4.2, Section 6.5.1, Section 6.5.2, Section 8.4.1, Section 8.4.2, Section 9.1.2, Section 10.1.2, Section 10.2.2, Section 10.3.2, Section 11.1.2, Section 11.2.3, Section 11.2.4, Section 11.2.5, Section 11.3.2, Section 11.3.3, Section 11.3.4, Section 11.3.5, Section 11.4.2, Section 11.4.3, Section 11.4.4, Section 11.4.5, Section 13.3, Appendix 2.7, Appendix 7.1 |
| | | |

Japanese Manual Version SH-080395-D

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

© 2003 MITSUBISHI ELECTRIC CORPORATION

INTRODUCTION

Thank you for purchasing the MELSEC-Q series PLC.
Before using the equipment, please read this manual carefully to develop full familiarity with the functions and performance of the Q series PLC you have purchased, so as to ensure correct use.
Please forward a copy of this manual to the end user.

CONTENTS


SAFETY PRECAUTIONS ..... A- 1
REVISIONS ..... A- 5
INTRODUCTION ..... A- 6
Conformation to the EMC Directive and Low Voltage Instruction ..... A-13
About the Generic Terms and Abbreviations ..... A-14
Product Components ..... A-16

1 OVERVIEW 1- 1 to 1-12

1.1 Overview ..... 1- 1
1.2 Compatibility with CC-Link ..... 1- 2
1.3 Features ..... 1- 2

2 SYSTEM CONFIGURATION 2- 1 to 2- 9

2.1 System Configuration ..... 2- 1
2.2 Applicable System ..... 2- 4
2.2.1 Applicable modules and number of CPUs that can be mounted ..... 2- 4
2.2.2 Notes on the system configuration ..... 2- 6
2.2.3 How to check the function version ..... 2- 8
2.2.4 CC-Link version ..... 2- 9

3 SPECIFICATIONS 3- 1 to 3- 7

3.1 Performance Specifications ..... 3- 1
3.1.1 Maximum overall cable distance (for Ver. 1.00) ..... 3- 3
3.1.2 Maximum overall cable distance (for Ver. 1.10) ..... 3- 5
3.2 CC-Link Dedicated Cable ..... 3- 6

4 FUNCTIONS 4- 1 to 4-75

4.1 Function List ..... 4- 1
4.2 Basic Functions ..... 4- 3
4.2.1 Communication with the remote I/O stations ..... 4- 3
4.2.2 Communication with the remote device stations ..... 4- 5
4.2.3 Communication with the local stations ..... 4-10
4.2.4 Communication with the intelligent device stations ..... 4-16
4.2.5 Parameter setting with GX Developer ..... 4-22
4.2.6 Parameter setting with dedicated instruction ..... 4-23

4.3 Functions for Improving System Reliability ..... 4-25
4.3.1 Disconnecting data link faulty stations and continuing the data link with only normal stations (Slave station cut-off function) ..... 4-25
4.3.2 Automatically reconnecting a disconnected data link faulty station when it returns to normal (Automatic return function) ..... 4-26
4.3.3 Continuing the data link when an error occurs in the master station PLC CPU (Data link status setting when the master station PLC CPU has an error) ..... 4-27
4.3.4 Retaining the device status of a data link faulty station (Setting the status of input data from a data link faulty station) ..... 4-28
4.3.5 Clearing data in case of PLC CPU STOP (Slave station refresh/compulsory clear setting in case of PLC CPU STOP) ..... 4-29
4.3.6 Continuing the data link even when the master station is faulty (Standby master function) ..... 4-31
4.4 Handy Functions ..... 4-45
4.4.1 Simplifying the initialization procedure registration of remote device stations (Remote device station initialization procedure registration function) ..... 4-45
4.4.2 Performing high-speed processing (Event issuance for the interrupt program) ..... 4-49
4.4.3 Enabling the data link simply by powering on (Automatic CC-Link startup) ..... 4-52
4.4.4 Communicating with intelligent device stations (Remote net mode) ..... 4-54
4.4.5 Speeding up the response from remote I/O stations (Remote I/O net mode) ..... 4-54
4.4.6 Creating a program that contains modules to be added in the future (Reserved station function) ..... 4-55
4.4.7 Powering off a station in operation without error detection (Error invalid station setting function) ..... 4-56
4.4.8 Synchronizing the link scan with the sequence scan (Scan synchronous function) ..... 4-57
4.4.9 Replacing modules without error detection (Temporary error invalid station setting function) ..... 4-61
4.4.10 Checking operations for each local station (Data link stop/restart) ..... 4-62
4.4.11 Station number overlap checking function ..... 4-63
4.4.12 Multiple PLC system support ..... 4-64
4.4.13 Reducing the reserved points of the remote I/O stations (Remote I/O station points setting) ..... 4-65
4.4.14 Increasing the number of cyclic points (Remote net ver.2 mode) ..... 4-67
4.5 Transient Transmission Functions ..... 4-75
4.5.1 Performing transient transmission (Dedicated instructions) ..... 4-75

5 DATA LINK PROCESSING TIME 5- 1 to 5-45

5.1 Link Scan Time ..... 5- 1
5.2 Transmission Delay Time ..... 5- 4
5.2.1 Master station ↔ remote I/O station ..... 5- 4
5.2.2 Master station ↔ remote device station (Ver. 1 compatible slave station) ..... 5- 7
5.2.3 Master station ↔ remote device station (Ver. 2 compatible slave station) ..... 5-12
5.2.4 Master station ↔ local station (Ver. 1 compatible slave station) ..... 5-20
5.2.5 Master station ↔ local station (Ver. 2 compatible slave station) ..... 5-26
5.2.6 Master station ↔ intelligent device station ..... 5-34
5.3 Processing Time for Dedicated Instructions ..... 5-35
5.3.1 Master station ↔ local station ..... 5-35
5.3.2 Local station ↔ local station ..... 5-38
5.3.3 Master station ↔ intelligent device station ..... 5-39

5.4 Link Refresh Time ..... 5-40
5.4.1 Master station/local station ..... 5-40
5.5 Station Status at Error Occurrence ..... 5-44
5.5.1 Status of the master station, standby master station (when the master station is operating) and remote I/O station at error occurrence ..... 5-44
5.5.2 Status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence ..... 5-45

6 PARAMETER SETTINGS 6- 1 to 6-52

6.1 Procedure from Parameter Settings to Data Link Startup ..... 6- 1
6.1.1 CPU parameter area and master module parameter memory ..... 6- 1
6.1.2 Procedure from parameter settings to data link startup with GX Developer ..... 6- 2
6.1.3 Procedure from parameter settings to data link startup with dedicated instruction ..... 6- 2
6.2 Parameter Setting Items ..... 6- 3
6.3 Example of Parameter Settings with GX Developer (Remote net ver.1 mode) ..... 6- 5
6.3.1 Master station network parameter settings ..... 6- 5
6.3.2 Master station automatic refresh parameter settings ..... 6-10
6.3.3 Local station network parameter settings ..... 6-12
6.3.4 Local station automatic refresh parameter settings ..... 6-15
6.4 Example of Parameter Settings with GX Developer (Remote net ver.2 mode) ..... 6-17
6.4.1 Master station network parameter settings ..... 6-17
6.4.2 Master station automatic refresh parameter settings ..... 6-22
6.4.3 Local station network parameter settings ..... 6-24
6.4.4 Local station automatic refresh parameter settings ..... 6-27
6.5 Example of Parameter Settings with GX Developer (Remote net additional mode) ..... 6-29
6.5.1 Master station network parameter settings ..... 6-29
6.5.2 Master station automatic refresh parameter settings ..... 6-34
6.5.3 Local station network parameter settings ..... 6-37
6.5.4 Local station automatic refresh parameter settings ..... 6-40
6.6 Example of Parameter Settings with GX Developer (Remote I/O net mode) ..... 6-43
6.6.1 Master station network parameter settings ..... 6-43
6.6.2 Master station automatic refresh parameter settings ..... 6-46
6.7 Example of Parameter Setting with Dedicated Instruction ..... 6-48

7 PROCEDURE BEFORE STARTING THE DATA LINK 7- 1 to 7-18

7.1 Procedure Before Starting the Data Link ..... 7- 1
7.2 Installation ..... 7- 3
7.2.1 Handling precautions ..... 7- 3
7.2.2 Installation environment ..... 7- 4
7.3 Part Identification Nomenclature and Settings ..... 7- 4
7.4 Checking the Module Status (Hardware Test) ..... 7- 7
7.5 Connecting the Modules Using the CC-Link Dedicated Cables ..... 7- 9
7.5.1 Wiring check ..... 7-10
7.6 T-Branch Connection with the CC-Link Dedicated Cable ..... 7-11
7.6.1 T-Branch system configuration ..... 7-11
7.6.2 T-Branch communication specifications list ..... 7-12

7.7 Switch Settings ..... 7-13
7.7.1 Station number setting ..... 7-13
7.7.2 Transmission rate and mode settings ..... 7-14
7.8 Checking the Connection Status (Line Test) ..... 7-15

8 PROGRAMMING 8- 1 to 8-40

8.1 Precautions on Programming ..... 8- 1
8.2 I/O Signals for the PLC CPU ..... 8- 2
8.2.1 I/O signal list ..... 8- 2
8.2.2 Details of the I/O signals ..... 8- 4
8.3 Buffer Memory ..... 8- 5
8.3.1 Buffer memory list ..... 8- 5
8.3.2 Buffer memory details ..... 8- 8
8.4 Link Special Relays and Registers (SB/SW) ..... 8-26
8.4.1 Link special relays (SB) ..... 8-26
8.4.2 Link special registers (SW) ..... 8-31
8.5 Mode Selection Method ..... 8-40

9 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE I/O STATIONS 9- 1 to 9-10

9.1 When Remote I/O Net Mode is Used ..... 9- 1
9.1.1 Configuring a system ..... 9- 1
(1) Setting the master station ..... 9- 2
(2) Setting the remote I/O stations ..... 9- 3
9.1.2 Setting the master station parameters ..... 9- 4
(1) Setting the network parameters of the master station ..... 9- 4
(2) Setting the automatic refresh parameters of the master station ..... 9- 6
9.1.3 Creating a program ..... 9- 7
9.1.4 Performing the data link ..... 9- 9
(1) Confirming the operation with the LED display ..... 9- 9
(2) Confirming the operation with the sequence program ..... 9-10

10 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE DEVICE STATIONS 10- 1 to 10-57

10.1 When Remote Net Ver. 1 Mode is Used ..... 10- 1
10.1.1 Configuring a system ..... 10- 1
(1) Setting the master station ..... 10- 2
(2) Setting the remote device station ..... 10- 3
10.1.2 Setting the master station parameters ..... 10- 4
(1) Setting the network parameters of the master station ..... 10- 4
(2) Setting the automatic refresh parameters of the master station ..... 10- 6
10.1.3 Initial setting of the remote device station ..... 10- 7
(1) Setting the target station number ..... 10- 7
(2) Setting the regist procedure registration ..... 10- 7
(3) Validating the remote device station initial settings ..... 10-11
10.1.4 Creating a program ..... 10-13

10.1.5 Performing the data link ..... 10-16
(1) Confirming the operation with the LED display ..... 10-16
(2) Confirming the operation with the sequence program ..... 10-17
10.2 When Remote Net Ver. 2 Mode is Used ..... 10-18
10.2.1 Configuring a system ..... 10-18
(1) Setting the master station ..... 10-19
(2) Setting the remote device station ..... 10-20
10.2.2 Setting the master station parameters ..... 10-22
(1) Setting the network parameters of the master station ..... 10-22
(2) Setting the automatic refresh parameters of the master station ..... 10-24
10.2.3 Initial setting of the remote device station ..... 10-25
(1) Setting the target station number ..... 10-25
(2) Setting the regist procedure registration ..... 10-25
(3) Validating the remote device station initial settings ..... 10-29
10.2.4 Creating a program ..... 10-32
10.2.5 Performing the data link ..... 10-36
(1) Confirming the operation with the LED display ..... 10-36
(2) Confirming the operation with the sequence program ..... 10-37
10.3 When Remote Net Additional Mode is Used ..... 10-38
10.3.1 Configuring a system ..... 10-38
(1) Setting the master station ..... 10-39
(2) Setting the remote device station ..... 10-40
10.3.2 Setting the master station parameters ..... 10-42
(1) Setting the network parameters of the master station ..... 10-42
(2) Setting the automatic refresh parameters of the master station ..... 10-44
10.3.3 Initial setting of the remote device station ..... 10-45
(1) Setting the target station number ..... 10-45
(2) Setting the regist procedure registration ..... 10-45
(3) Validating the remote device station initial settings ..... 10-49
10.3.4 Creating a program ..... 10-52
10.3.5 Performing the data link ..... 10-56
(1) Confirming the operation with the LED display ..... 10-56
(2) Confirming the operation with the sequence program ..... 10-57

11 COMMUNICATION BETWEEN THE MASTER STATION AND LOCAL STATIONS 11- 1 to 11-47

11.1 Secured 32-bit Data ..... 11- 1
11.2 When Remote Net Ver.1 Mode is Used ..... 11- 2
11.2.1 Configuring a system ..... 11- 2
(1) Setting the master and local stations ..... 11- 3
11.2.2 Setting the master station parameters ..... 11- 4
(1) Setting the network parameters of the master station ..... 11- 4
(2) Setting the automatic refresh parameters of the master station ..... 11- 6
11.2.3 Setting the local station parameters ..... 11- 7
(1) Setting the network parameters of the local station ..... 11- 7
(2) Setting the automatic refresh parameters of the local station ..... 11- 9

11.2.4 Creating a program ..... 11-10
(1) Master station program ..... 11-12
(2) Local station program ..... 11-12
11.2.5 Performing the data link ..... 11-14
(1) Confirming the operation with the LED display ..... 11-14
(2) Confirming the operation with the sequence program ..... 11-15
11.3 When Remote Net Ver. 2 Mode is Used ..... 11-16
11.3.1 Configuring a system ..... 11-16
(1) Setting the master and local stations ..... 11-17
11.3.2 Setting the master station parameters ..... 11-18
(1) Setting the network parameters of the master station ..... 11-18
(2) Setting the automatic refresh parameters of the master station ..... 11-20
11.3.3 Setting the local station parameters ..... 11-21
(1) Setting the network parameters of the ver.1 compatible local station (station number 1) ..... 11-21
(2) Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1) ..... 11-23
(3) Setting the network parameters of the ver.2 compatible local station (station number 5) ..... 11-24
(4) Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5) ..... 11-26
11.3.4 Creating a program ..... 11-27
(1) Master station program ..... 11-29
(2) Local station program ..... 11-29
11.3.5 Performing the data link ..... 11-30
(1) Confirming the operation with the LED display ..... 11-30
(2) Confirming the operation with the sequence program ..... 11-31
11.4 When Remote Net Additional Mode is Used ..... 11-32
11.4.1 Configuring a system ..... 11-32
(1) Setting the master and local stations ..... 11-33
11.4.2 Setting the master station parameters ..... 11-34
(1) Setting the network parameters of the master station ..... 11-34
(2) Setting the automatic refresh parameters of the master station ..... 11-36
11.4.3 Setting the local station parameters ..... 11-37
(1) Setting the network parameters of the ver.1 compatible local station (station number 1) ..... 11-37
(2) Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1) ..... 11-39
(3) Setting the network parameters of the ver.2 compatible local station (station number 5) ..... 11-40
(4) Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5) ..... 11-42
11.4.4 Creating a program ..... 11-43
(1) Master station program ..... 11-45
(2) Local station program ..... 11-45
11.4.5 Performing the data link ..... 11-46
(1) Confirming the operation with the LED display ..... 11-46
(2) Confirming the operation with the sequence program ..... 11-47

12 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATIONS 12- 1 to 12- 2

13 TROUBLESHOOTING 13- 1 to 13-21

13.1 Verification upon Problem Occurrence ..... 13- 1
13.2 Troubleshooting Procedures When the "ERR." LED of the Master Station is Flashing or When Normal Data cannot be Sent/Received During Data Link ..... 13- 8
13.3 Error Codes ..... 13-10
13.4 CC-Link Diagnostics Using the GX Developer ..... 13-16

APPENDIX App- 1 to App-46

Appendix 1 External Dimensions Diagram ..... App- 1
Appendix 2 Dedicated Instruction List ..... App- 2
Appendix 2.1 RIRD instruction ..... App- 3
Appendix 2.2 RIWT instruction ..... App- 8
Appendix 2.3 RIRCV instruction ..... App-13
Appendix 2.4 RISEND instruction ..... App-18
Appendix 2.5 RIFR instruction ..... App-23
Appendix 2.6 RITO instruction ..... App-26
Appendix 2.7 RLPASET instruction ..... App-29
Appendix 3 Differences Between the New and Previous Models ..... App-40
Appendix 4 Precautions when Changing from AJ61QBT11 to QJ61BT11N ..... App-41
Appendix 5 Precautions when Changing from QJ61BT11 to QJ61BT11N ..... App-41
Appendix 6 CPU-dependent Function Availability ..... App-42
Appendix 7 Parameter Setting Checklist ..... App-43
Appendix 7.1 Parameter setting checklist ..... App-43
Appendix 7.2 Station information setting checklist ..... App-44

INDEX Index- 1 to Index- 4

Conformation to the EMC Directive and Low Voltage Instruction

For details on making Mitsubishi PLC conform to the EMC directive and low voltage instruction when installing it in your product, please see Chapter 3, "EMC Directive and Low Voltage Instruction" of the User's Manual (Hardware) of the CPU module to use.
The CE logo is printed on the rating plate on the main body of the PLC that conforms to the EMC directive and low voltage instruction.
To conform this product to the EMC Directive and Low Voltage Directive, refer to the Section of "CC-Link Modules" in Chapter 3 "EMC Directive and Low Voltage Directive" of the User's Manual (Hardware) of the CPU module used.


A - 13

About the Generic Terms and Abbreviations

This manual uses the following generic terms and abbreviations to describe the QJ61BT11N CC-Link System Master/Local Module, unless otherwise specified.

| Generic Term/Abbreviation | Description |
|---|---|
| QJ61BT11N | Abbreviation for QJ61BT11N CC-Link System Master/Local Module |
| Cyclic transmission | Transmission method by which to periodically communicate the contents of remote I/O and remote registers. |
| Transient transmission | Transmission method with which the counterpart is specified and 1:1 communication is used at an arbitrary timing. |
| Master station | Station that controls the data link system.<br>One master station is required for each system. |
| Local station | Station having a PLC CPU and the ability to communicate with the master and other local stations. |
| Remote I/O station | Remote station that handles bit unit data only. (Performs input and output with external devices.) (AJ65BTB1-16D, AJ65SBTB1-16D) |
| Remote device station | Remote station that handles bit unit and word unit data only. (Performs input and output with external devices, and analog data conversion.)<br>(AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI) |
| Remote station | Generic term for remote I/O station and remote device station.<br>(Controlled by the master station) |
| Intelligent device station | Station that can perform transient transmission, such as the AJ65BT-R2 (including local stations). |
| Standby master station | Backup station for data link control when the link to the master station is disconnected due to a PLC CPU or power supply problem. |
| Slave station | Generic term for remote I/O station, remote device station, local station, intelligent device station and standby master station. |
| Master/local module | Generic term for QJ61BT11N, QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, and A1SJ61QBT11 |
| Master module | Generic term for QJ61BT11N, QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, and A1SJ61QBT11 when they are used as master stations. |
| Local module | Generic term for QJ61BT11N, QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, and A1SJ61QBT11 when they are used as local stations. |
| Remote module | Generic term for AJ65BTB1-16D, AJ65SBTB1-16D, AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI, and A852GOT |
| Intelligent device module | Module that can perform transient transmission, such as the AJ65BT-R2 (including local module). |
| Remote I/O net mode | Dedicated mode for sending and receiving data to and from the remote I/O station at high speed. |
| Remote net mode | Mode that can communicate with all stations used for CC-Link (remote I/O station, remote device station, local station, intelligent device station, and standby master station)<br>The remote net mode has three different modes: remote net ver. 1 mode, remote net ver. 2 mode, and remote net additional mode. |
| Remote net ver. 1 mode | Mode in which complete compatibility with the conventional module (QJ61BT11) is achieved.<br>Select this mode when the number of cyclic points need not be increased or when the QJ61BT11N is used to replace the conventional module as a maintenance product. |
| Remote net ver. 2 mode | Select this mode when increasing the number of cyclic points and configuring a new system. |
| Remote net additional mode | Select this mode when adding a ver. 2 compatible station to the existing system to increase the number of cyclic points. |
| Ver. 1 compatible slave station | Slave station compatible with the remote net ver. 1 mode. |
| Ver. 2 compatible slave station | Slave station compatible with the remote net ver. 2 mode. |

| Generic Term/Abbreviation | Description |
|---|---|
| SB | Link special relay (for CC-Link)<br>Bit unit information that indicates the module operating status and data link status of the master station/local station. (Expressed as SB for convenience) |
| SW | Link special register (for CC-Link)<br>16-bit unit information that indicates the module operating status and data link status of the master station/local station. (Expressed as SW for convenience) |
| RX | Remote input (for CC-Link)<br>Information entered in bit units from the remote station to the master station. (Expressed as RX for convenience) |
| RY | Remote output (for CC-Link)<br>Information output in bit units from the master station to the remote station. (Expressed as RY for convenience) |
| RWw | Remote register (Write area for CC-Link)<br>Information output in 16-bit units from the master station to the remote device station. (Expressed as RWw for convenience) |
| RWr | Remote register (Read area for CC-Link)<br>Information entered in 16-bit units from the remote device station to the master station. (Expressed as RWr for convenience) |
| ACPU | Generic term for AOJ2HCPU, A1SCPU, A1SHCPU, A1SJCPU-S3, A1SJHCPU, A2SCPU, A2SHCPU, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A1NCPU, A2NCPU, A2NCPU-S1, A3NCPU, A2ACPU, A2ACPU-S1, A3ACPU, A2UCPU, A2UCPU-S1, A3UCPU and A4UCPU |
| AnUCPU | Generic term for A2USCPU, A2USCPU-S1, A2USHCPU-S1, A2UCPU, A2UCPU-S1, A3UCPU and A4UCPU |
| QnACPU | Generic term for Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q2ACPU, Q2ACPU-S1, Q3ACPU, Q4ACPU and Q4ARCPU |
| QCPU (Q mode) | Generic term for Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU, Q12PHCPU, Q25PHCPU |
| QCPU (A mode) | Generic term for Q02CPU-A, Q02HCPU-A, Q06HCPU-A |
| QnCPU | Generic term for Q00JCPU, Q00CPU, Q01CPU and Q02CPU. |
| QnHCPU | Generic term for Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PHCPU and Q25PHCPU. |
| GX Developer | Generic product name of the product types SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV and SWnD5C-GPPW-EVA. ("n" in the model name is 4 or greater) |
| Intelligent function module | Q series modules other than the CPU module, power supply module and I/O module that are mounted on the base unit. |
| Special function module | A series and QnA series modules that are mounted on the base unit, excluding the CPU module, power supply module and I/O module. |

Product Components

The components of the QJ61BT11N are listed below.

| Item name | Quantity |
|---|---|
| QJ61BT11N main unit | 1 |
| Terminal resistor 110 Ω, 1/2 W (brown-brown-brown)<br>(used when wiring with the CC-Link dedicated cable or Version 1.10 compatible CC-Link dedicated cable) | 2 |
| Terminal resistor 130 Ω, 1/2 W (brown-orange-brown)<br>(used when wiring with the CC-Link dedicated high-performance cable) | 2 |

# 1 OVERVIEW



This manual describes the specifications, parts names and settings of the QJ61BT11N CC-Link System Master/Local Module (hereinafter referred to as the QJ61BT11N) which is used with the MELSEC-Q series PLC CPUs.
When applying the following program examples to the actual system, make sure to examine the applicability and confirm that it will not cause system control problems.

## 1.1 Overview

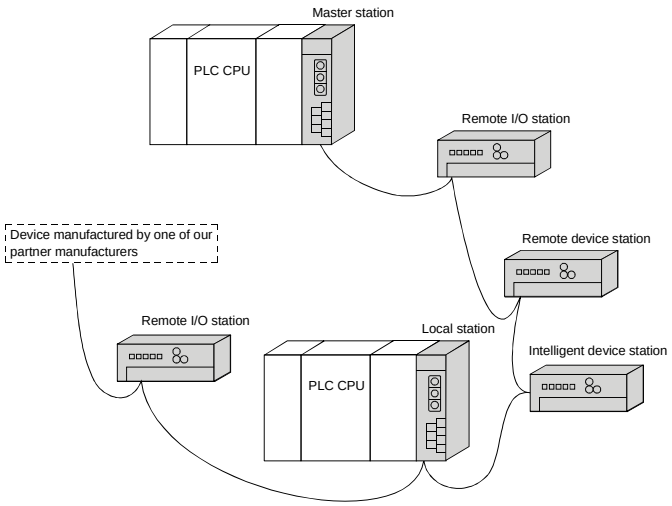
The CC-Link system connects distributed modules such as an I/O module, an intelligent function module, and a special function module using dedicated cables so that these modules can be controlled by the PLC CPU.

(1) By distributing each module to an equipment device such as a conveyor line and a machine device, the wiring efficiency of the entire system can be accomplished.

(2) On/off information of input/output and numeric data that are handled by modules can easily be sent and received at high-speed.

(3) By connecting multiple PLC CPUs, a simple distributed system can be configured.

(4) By connecting various devices made by Mitsubishi's partner manufacturers, the system can provide flexible solutions to meet a wide range of user needs.




Master station ·····The station that controls the data link system.
Remote I/O station ·····The remote station that handles bit unit data only.
Remote device station ····The remote station that handles bit unit and word unit data only.
Local station ·····The station having a PLC CPU and the ability to communicate with the master and other local stations.
Intelligent device station ··The station that can perform transient transmission.

## 1.2 Compatibility with CC-Link



This product supports following CC-Link functions and performance.

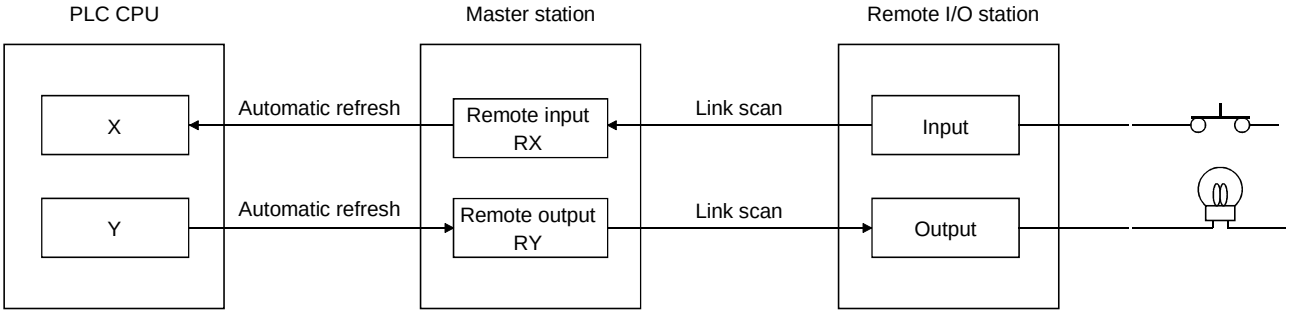
- Cyclic transmission
- Increase of cyclic transmission data size
- Transient transmission
- Less restrictions on the station-to-station cable length

## 1.3 Features

The features of the CC-Link are described below.

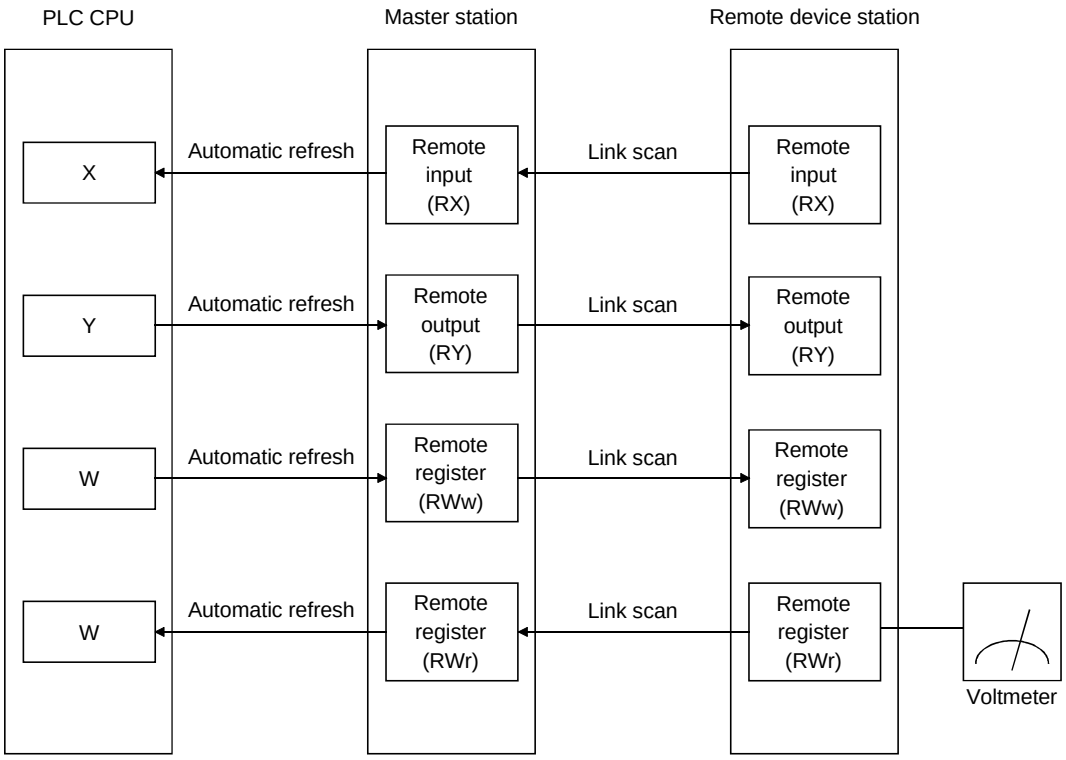
### (1) Remote I/O station communication

The ON/OFF status of a switch or indicator lamp is communicated using the remote input RX and remote output RY (see Section 4.2.1).



### (2) Remote device station communication

Signals for handshaking with the remote device station (initial request, error occurred flag, etc.) are communicated using the remote input RX and remote output RY. The setting data to the remote device station are communicated using remote registers RWw and RWr (see Section 4.2.2).

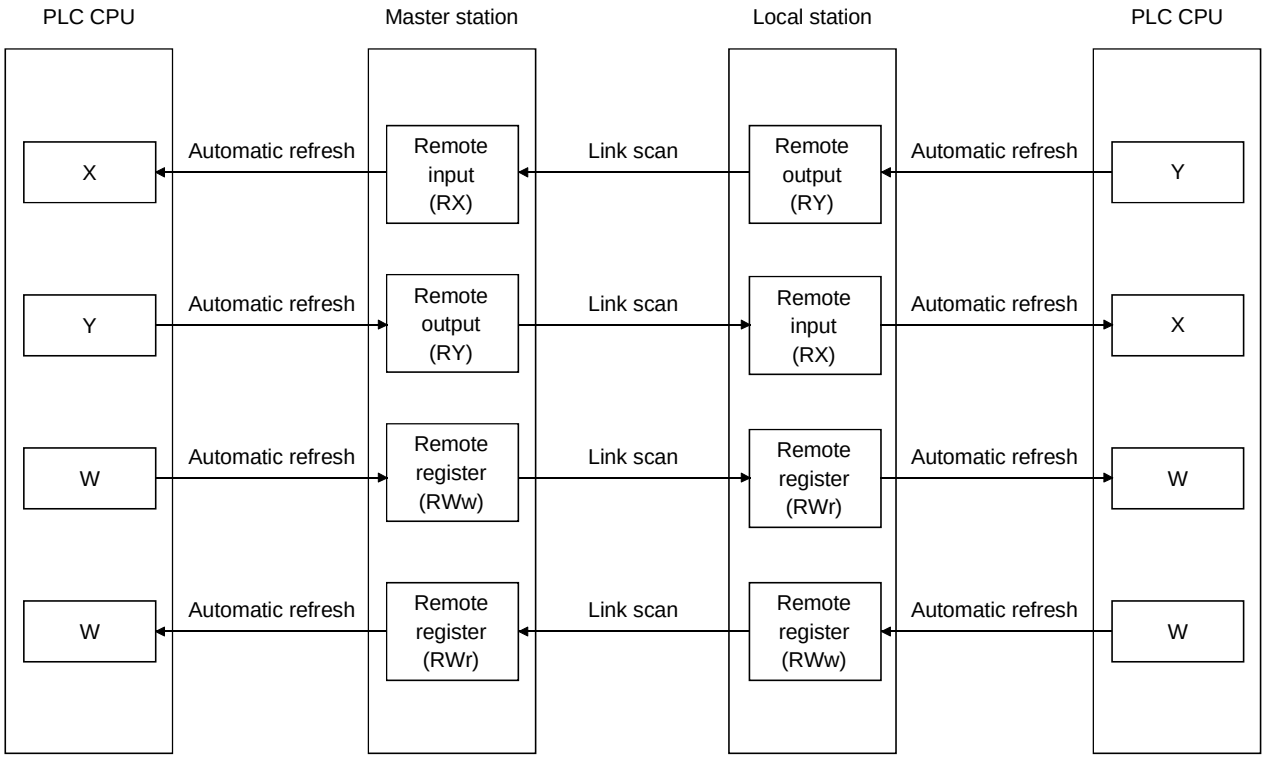


### (3) Local station communication

Communication between the master station and the local station uses two types of transmission methods: cyclic transmission and transient transmission (see Section 4.2.3).

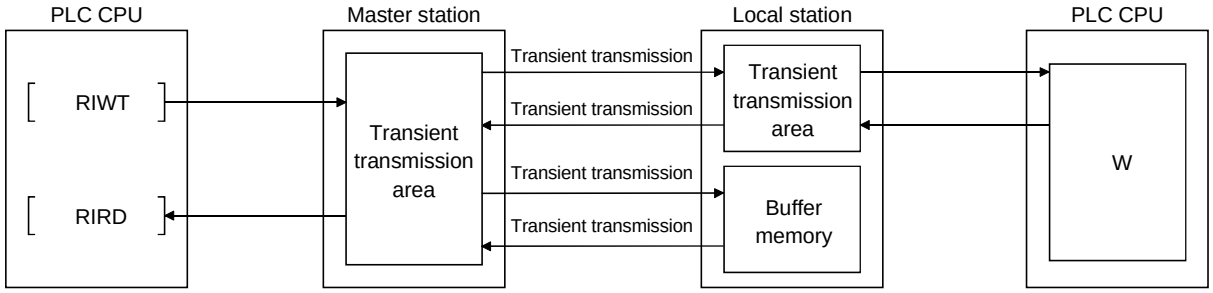
(a) Cyclic transmission

Data communication between the PLC CPUs can be performed in N:N mode using bit data (remote input RX and remote output RY) and word data (remote registers RWw and RWr).




(b) Transient transmission

Read (RIRD) or write (RIWT) operation of the local station buffer memory and CPU device can be performed at any timing.

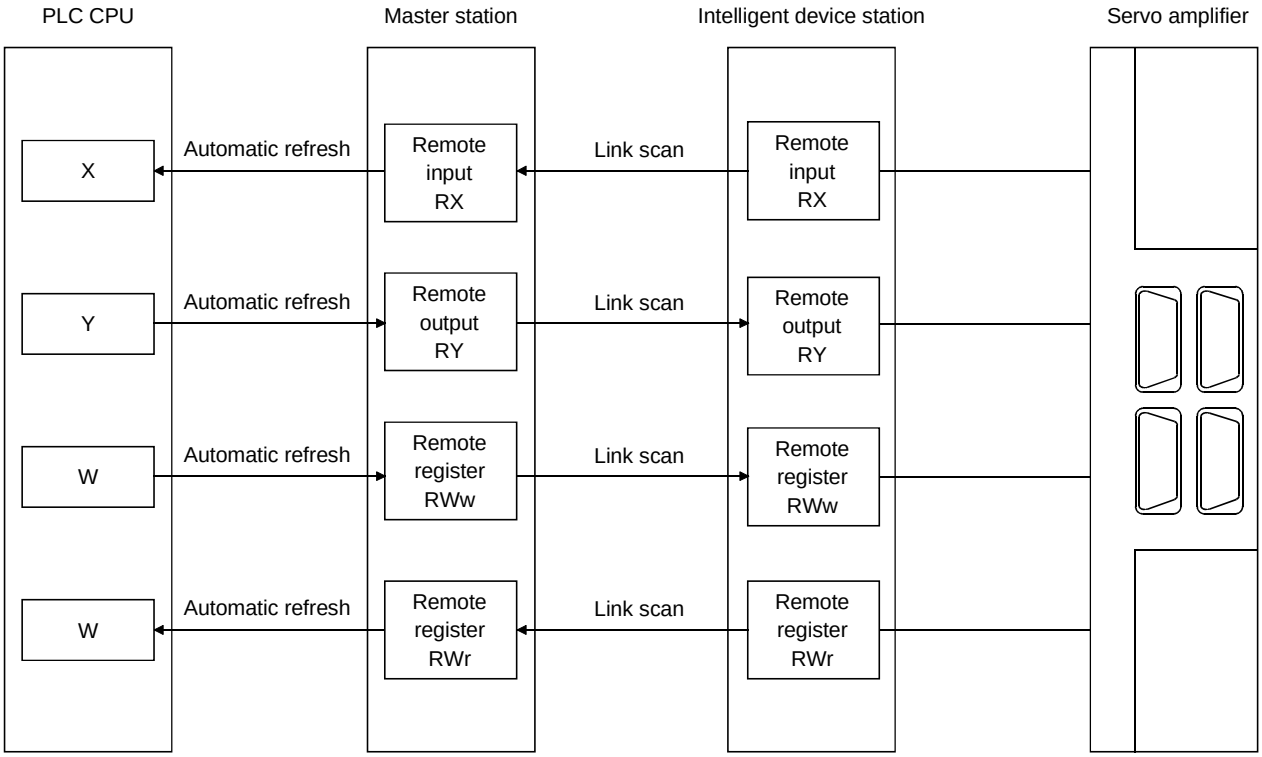


### (4) Intelligent device station communication

Communication between the master station and the intelligent device station uses two types of transmission methods: cyclic transmission and transient transmission (see Section 4.2.4).

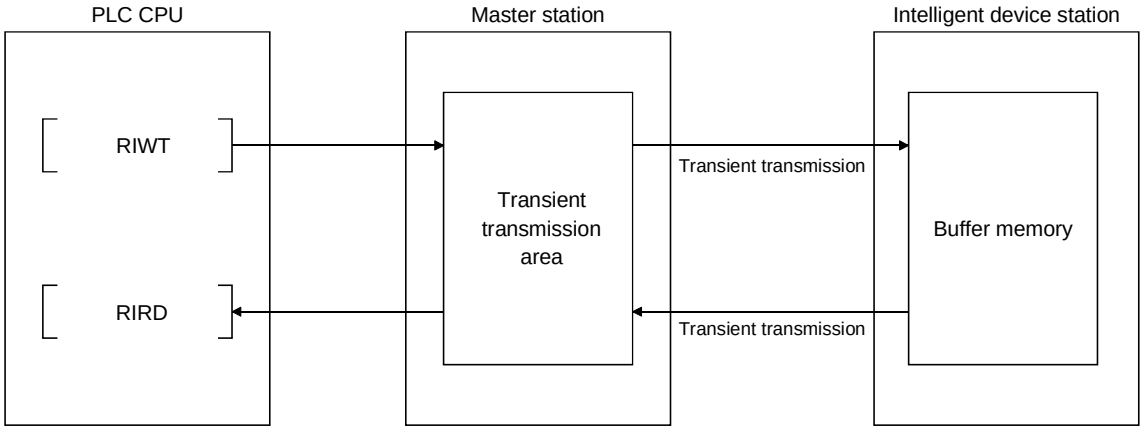
(a) Cyclic transmission

Signals for handshaking with the intelligent device station (positioning start, positioning complete, etc.) are communicated using the remote input RX and remote output RY. Numeric data (positioning start number, present feed value, etc.) is communicated using remote registers RWw and RWr.




(b) Transient transmission

Read (RIRD) or written (RIWT) operation of the intelligent device station buffer memory can be performed at any timing.



### (5) Parameter setting by GX Developer or the dedicated instruction

There are two parameter setting methods; the parameters can either be set by GX Developer or by using a dedicated instruction (see Sections 2.2.1, 4.2.5 and 4.2.6).

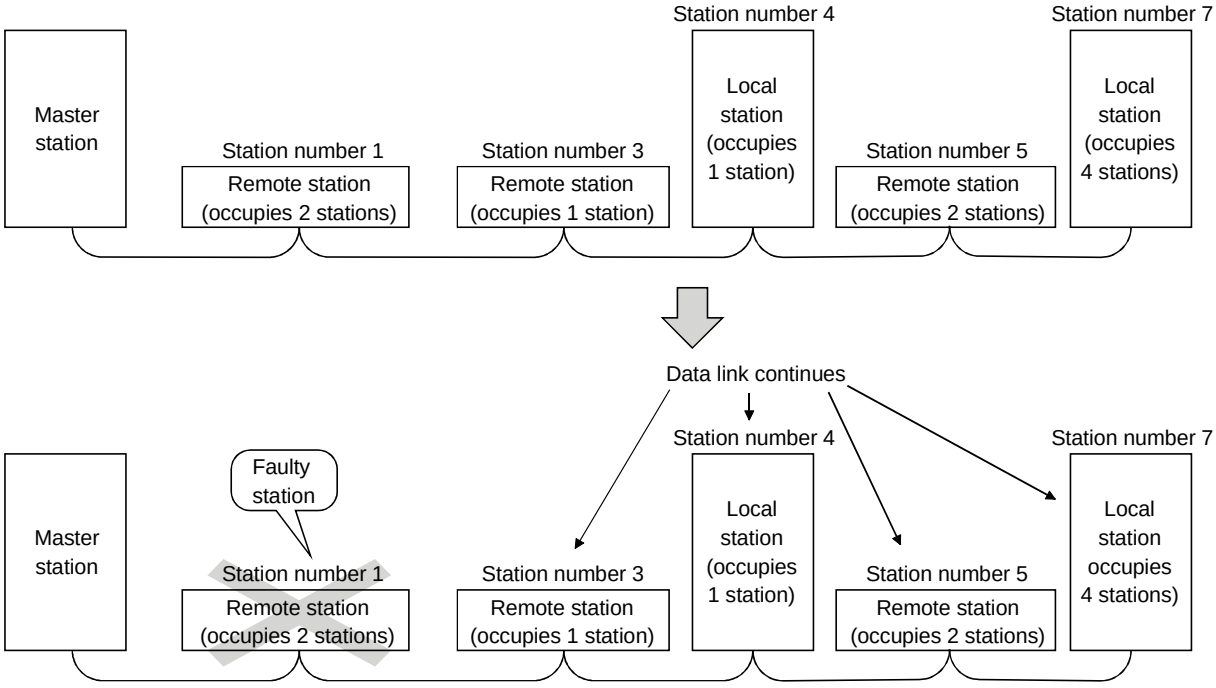
The following table lists the differences between the two setting methods.

| | Program requirement for setting parameters | Automatic refresh | Number of CPUs that can be mounted | Changing the parameter settings while the PLC CPU is running |
|---|---|---|---|---|
| Parameter setting with GX Developer | Not required | ○ | 4 modules | × |
| Parameter setting with dedicated instruction | Required | × | 64 modules | ○ |

### (6) System down prevention (Slave station cut-off function)

Because the system employs the bus connection method, even if a module system fails due to power off, it will not affect the communication with other normal modules.

Also, for a module using a 2-piece terminal block, the module can be replaced during data link. (Replace the module after turning off the module power). However, if the cable is disconnected, data link to all stations are disabled (see Section 4.3.1).




### (7) Automatic return function

When a station that has been disconnected from the link due to power off recovers the normal status, it will join the data link automatically (see Section 4.3.2).

### (8) Data link status setting when the master station PLC CPU has an error

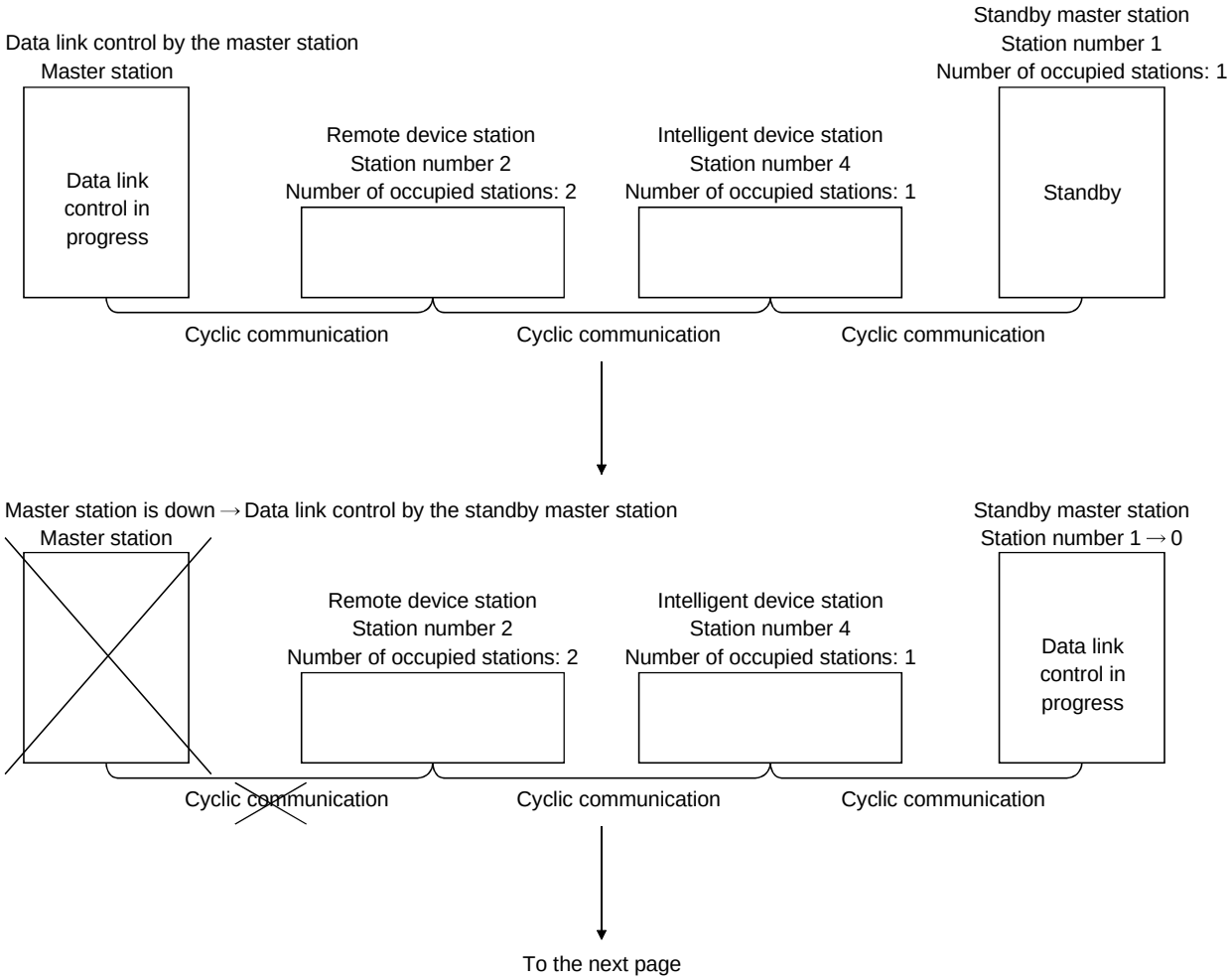
The data-link status can be set to either "stop" or "continue" when an error causing the operation to stop such as "SP. UNIT ERROR" occurs in the PLC CPU at the master station. With errors enabling the operation to continue such as "BATTERY ERROR," the data link will continue regardless of the setting (see Section 4.3.3).

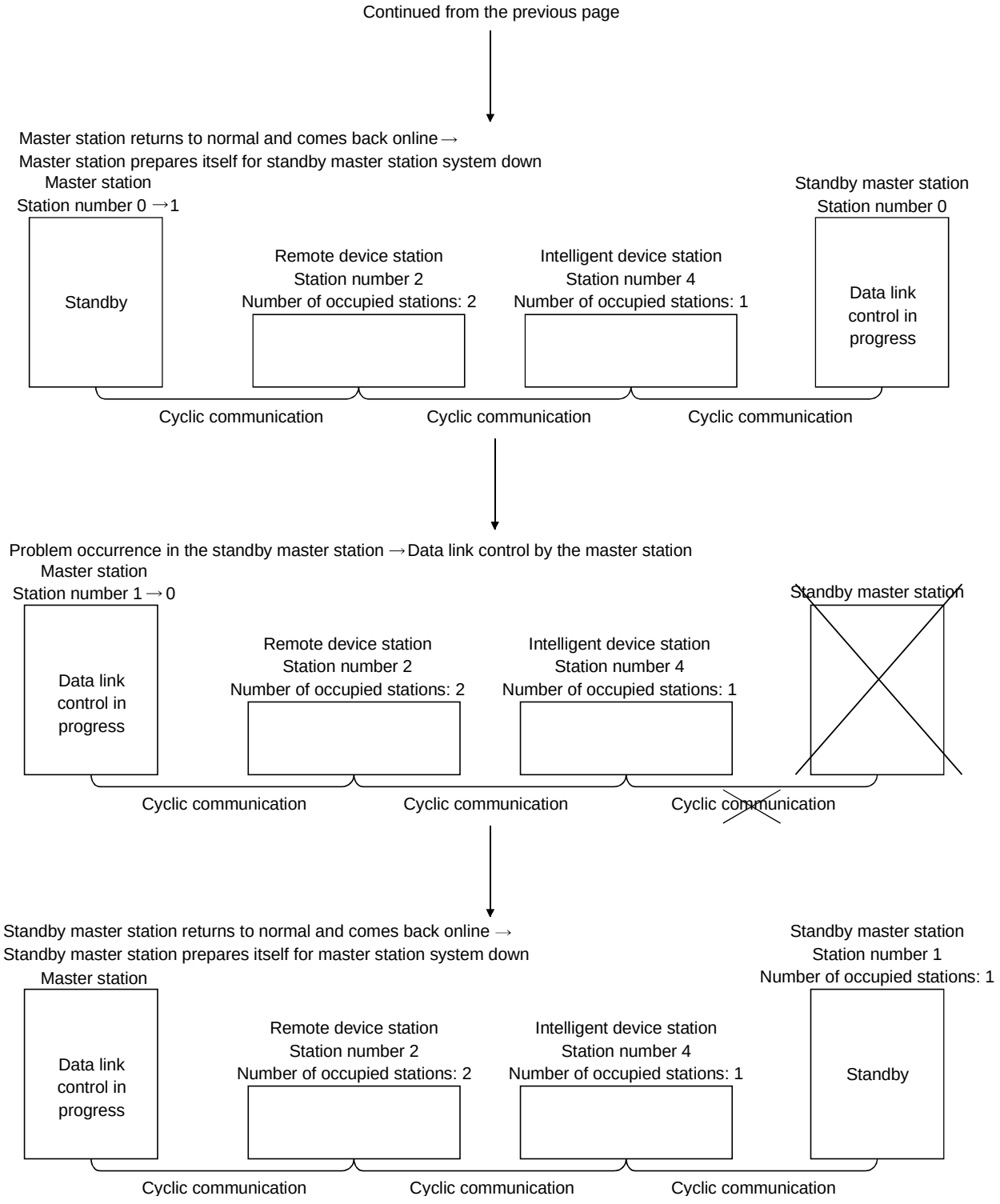
### (9) Setting the status of input data from a data link faulty station

The data entered (received) from a data-link faulty station can be cleared or the previous status immediately before the error can be maintained (see Section 4.3.4).

### (10) Standby master function

This function enables the data link to continue working by switching to a standby master station (backup station for the master station) if a malfunction occurs in the master station due to a malfunction of the PLC CPU or power supply.
The master station can return to online even during data link control by the standby master station, and prepares itself for standby master station system down (see Section 4.3.6).




Continued from the previous page
Master station returns to normal and comes back online →
Master station prepares itself for standby master station system down
Master station
Station number 0 →1
Standby master station
Station number 0
Standby
Remote device station
Station number 2
Number of occupied stations: 2
Intelligent device station
Station number 4
Number of occupied stations: 1
Data link control in progress
Cyclic communication
Cyclic communication
Cyclic communication
Problem occurrence in the standby master station →Data link control by the master station
Master station
Station number 1 →0
Standby master station
Data link control in progress
Remote device station
Station number 2
Number of occupied stations: 2
Intelligent device station
Station number 4
Number of occupied stations: 1
Cyclic communication
Cyclic communication
Cyclic communication
Standby master station returns to normal and comes back online →
Standby master station prepares itself for master station system down
Master station
Standby master station
Station number 1
Number of occupied stations: 1
Data link control in progress
Remote device station
Station number 2
Number of occupied stations: 2
Intelligent device station
Station number 4
Number of occupied stations: 1
Standby
Cyclic communication
Cyclic communication
Cyclic communication

### (11) Remote device station initialization procedure registration function

This function performs the initial setting for the remote device station using the GX Developer, without creating a sequence program (see Section 4.4.1).

### (12) Event issuance for the interrupt program

This function issues an event when the conditions set by the GX Developer are established in order to make the PLC CPU execute the interrupt program (see Section 4.4.2).

### (13) Automatic CC-Link startup

By installing the QJ61BT11N, the CC-Link is started up and all data are refreshed by simply turning on the power, without creating a sequence program. However, when the number of connected modules is less than 64, it is necessary to set the network parameters in order to optimize the link scan time (see Section 4.4.3.).

### (14) Selecting a mode according to the system

The CC-Link system has four types of modes according to various systems. (See sections 4.4.4, 4.4.5 and 4.4.14.)

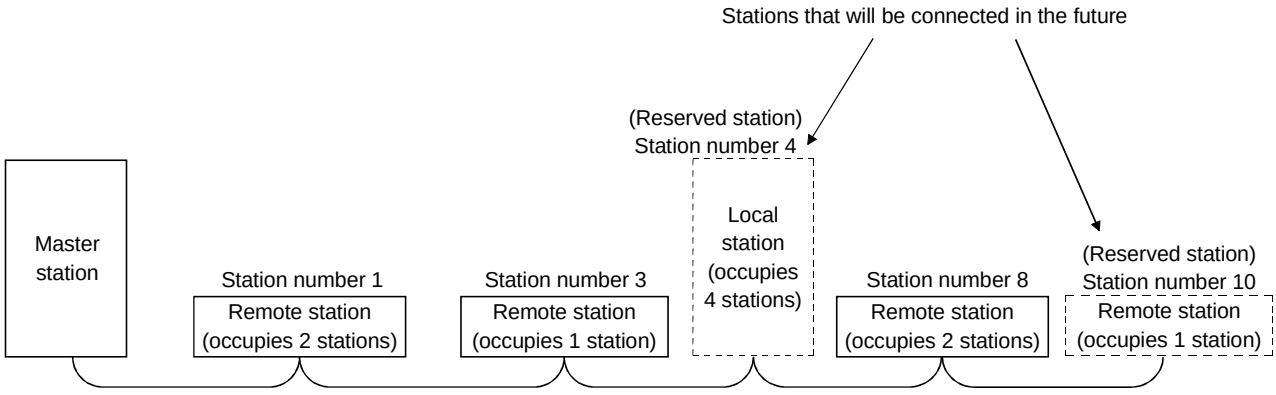
The overview of the modes is described in the following table.

| Mode | Connectable | Overview |
|---|---|---|
| Remote net ver. 1 mode | Remote I/O station<br>Remote device station<br>Intelligent device station<br>Local station<br>Standby master station | Mode in which complete compatibility with the conventional module (QJ61BT11) is achieved.<br>Select this mode when the number of cyclic points need not be increased or when the QJ61BT11N is used to replace the conventional module as a maintenance product. |
| Remote net ver. 2 mode | | Select this mode when increasing the number of cyclic points and configuring a new system. |
| Remote net additional mode | | Select this mode when adding a ver.2 compatible slave station to the existing system to increase the number of cyclic points. |
| Remote I/O net mode | Remote I/O station | Select this mode when the system consists of only the master station and remote I/O stations.<br>Since cyclic transmission is made at high speed, the link scan time can be reduced. |

### (15) Reserved station function

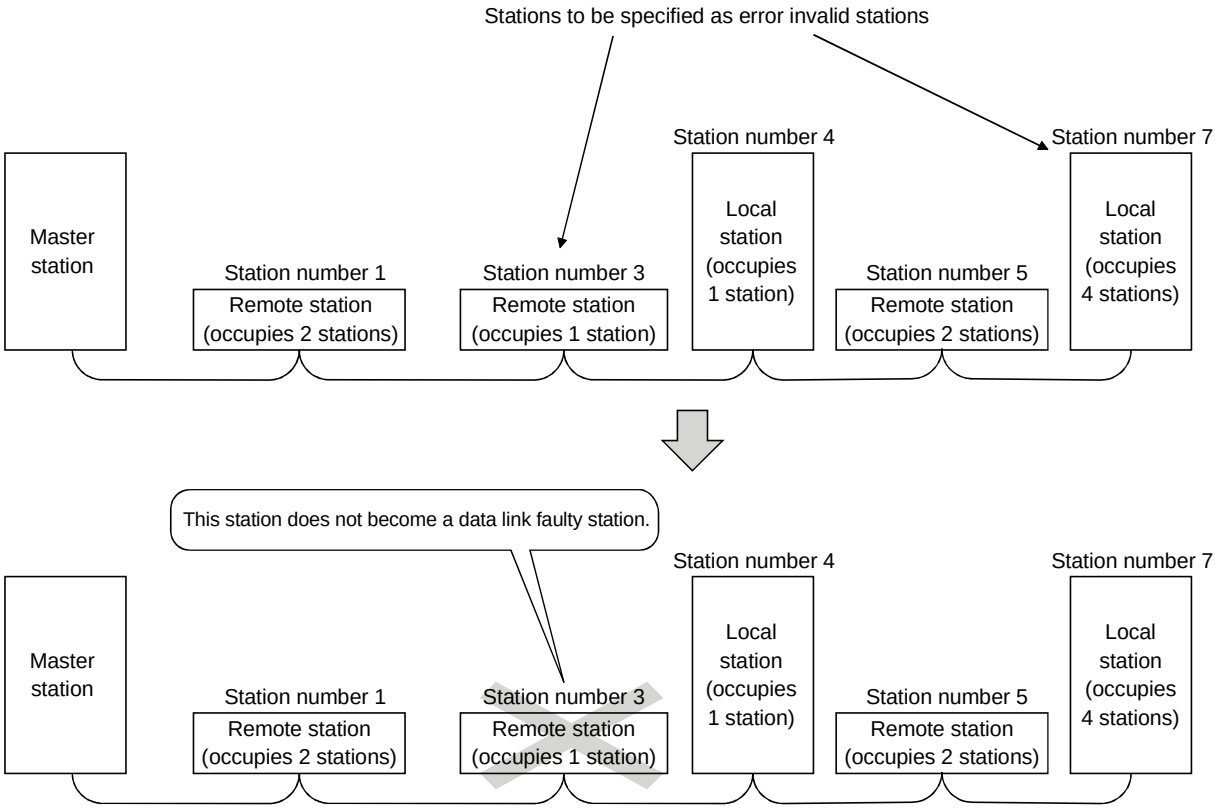
Stations that are not actually connected (stations to be connected in the future) will not be treated as faulty stations if they are specified as reserved stations.

The reserved stations can also be set as 0 points. (see Section 4.4.6).



### (16) Error invalid station setting function

By setting the network parameters, the module that is powered off in the system configuration will not be treated as a "data link faulty station" by the master station and local station. However, caution is required since errors are no longer detected (see Section 4.4.7).


Stations to be specified as error invalid stations
Station number 4
Station number 7
Master station
Station number 1
Remote station (occupies 2 stations)
Station number 3
Remote station (occupies 1 station)
Local station (occupies 1 station)
Station number 5
Remote station (occupies 2 stations)
Local station (occupies 4 stations)
This station does not become a data link faulty station.
Station number 4
Station number 7
Master station
Station number 1
Remote station (occupies 2 stations)
Station number 3
Remote station (occupies 1 station)
Local station (occupies 1 station)
Station number 5
Remote station (occupies 2 stations)
Local station (occupies 4 stations)

### (17) Scan synchronous function

This function synchronizes the link scan to the sequence scan (see Section 4.4.8).

### (18) Temporary error invalid station setting function

With this function, the module specified by the GX Developer will not be treated as a "data link faulty station" by the master or local station while in online. The module can be replaced without detecting an error in online (see Section 4.4.9).

### (19) Data link stop/restart

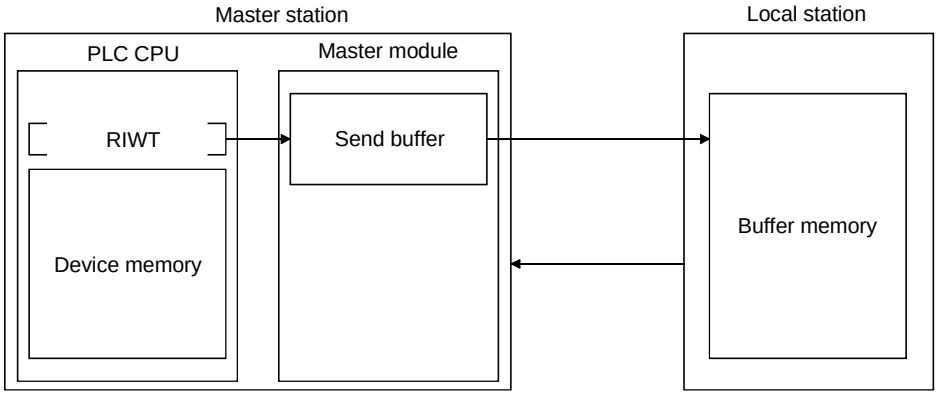
The data link can be stopped and restarted while it is being used (see Section 4.4.10).

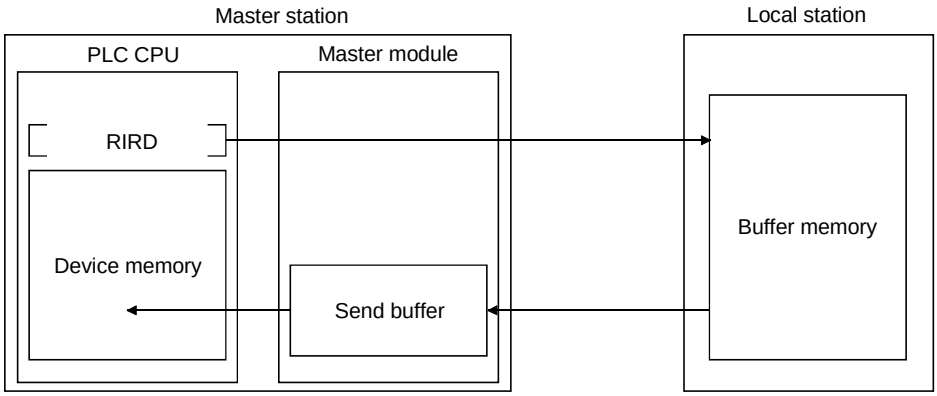
### (20) Station number overlap checking function

This function checks the status of the connected stations to see if the number of occupied stations is overlapping or if there is more than one station with the station number setting of 0 in the system (see Section 4.4.11).

### (21) Transient transmission

With this method of transmission, the counterpart is specified and 1:1 communication is performed at an arbitrary timing (see Section 4.5).



### (22) Compatibility with conventional module

The QJ61BT11N achieves complete compatibility with the conventional module (QJ61BT11) in the remote net ver. 1 mode.
Select the remote net ver. 1 mode when the number of cyclic points need not be increased or when the QJ61BT11N is used to replace the conventional module as a maintenance product.

### (23) Cyclic points increase

Selection of the remote net ver. 2 mode or remote net additional mode allows RX/RY to be increased to up to 8192 points and RWr/RWw to up to 2048 words per network by making expanded cyclic setting (single, double, quadruple, octuple).
Also, RX/RY can be increased to up to 224 points and RWr/RWw to up to 32 words per station. (See Section 4.4.14.)

### (24) Remote I/O station points setting

Set the number of I/O points of a remote I/O station.
This setting minimizes CPU device assignment and reduces the reserved points of remote input RX and remote output RX for remote I/O stations. (See Section 4.4.13.)

### (25) Slave station refresh/compulsory clear setting in case of PLC CPU STOP

Set whether output data to the remote, local, intelligent device and standby master stations will be refreshed or compulsorily cleared when the PLC CPU comes to STOP. (See Section 4.3.5.)

# 2 SYSTEM CONFIGURATION

The system configuration for the CC-Link is described below.

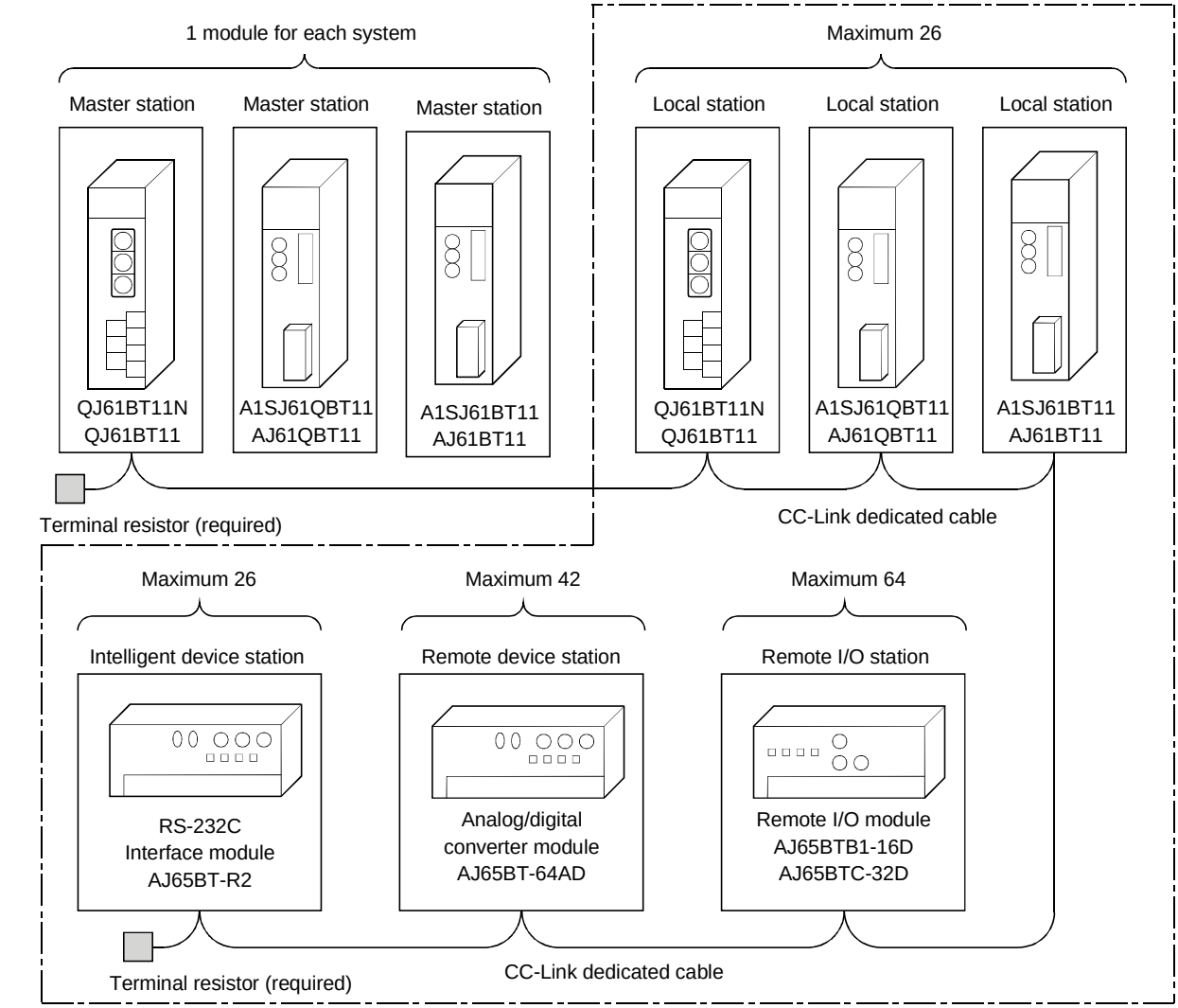
## 2.1 System Configuration



### (1) Remote net ver. 1 mode

A total of 64 remote I/O stations, remote device stations, local stations, standby master stations, or intelligent device stations can be connected to a single master station.
However, the following conditions must all be satisfied.

| | | |
|---|---|---|
| Condition 1 | {(1 × a) + (2 × b) + (3 × c) + (4 × d)} ≦ 64 | a: Number of modules occupying 1 station<br>b: Number of modules occupying 2 stations<br>c: Number of modules occupying 3 stations<br>d: Number of modules occupying 4 stations |
| Condition 2 | {(16 × A) + (54 × B) + (88 × C)} ≦ 2304 | A: Number of remote I/O stations ≦ 64<br>B: Number of remote device stations ≦ 42<br>C: Number of local stations, standby master stations and intelligent device stations ≦ 26 |

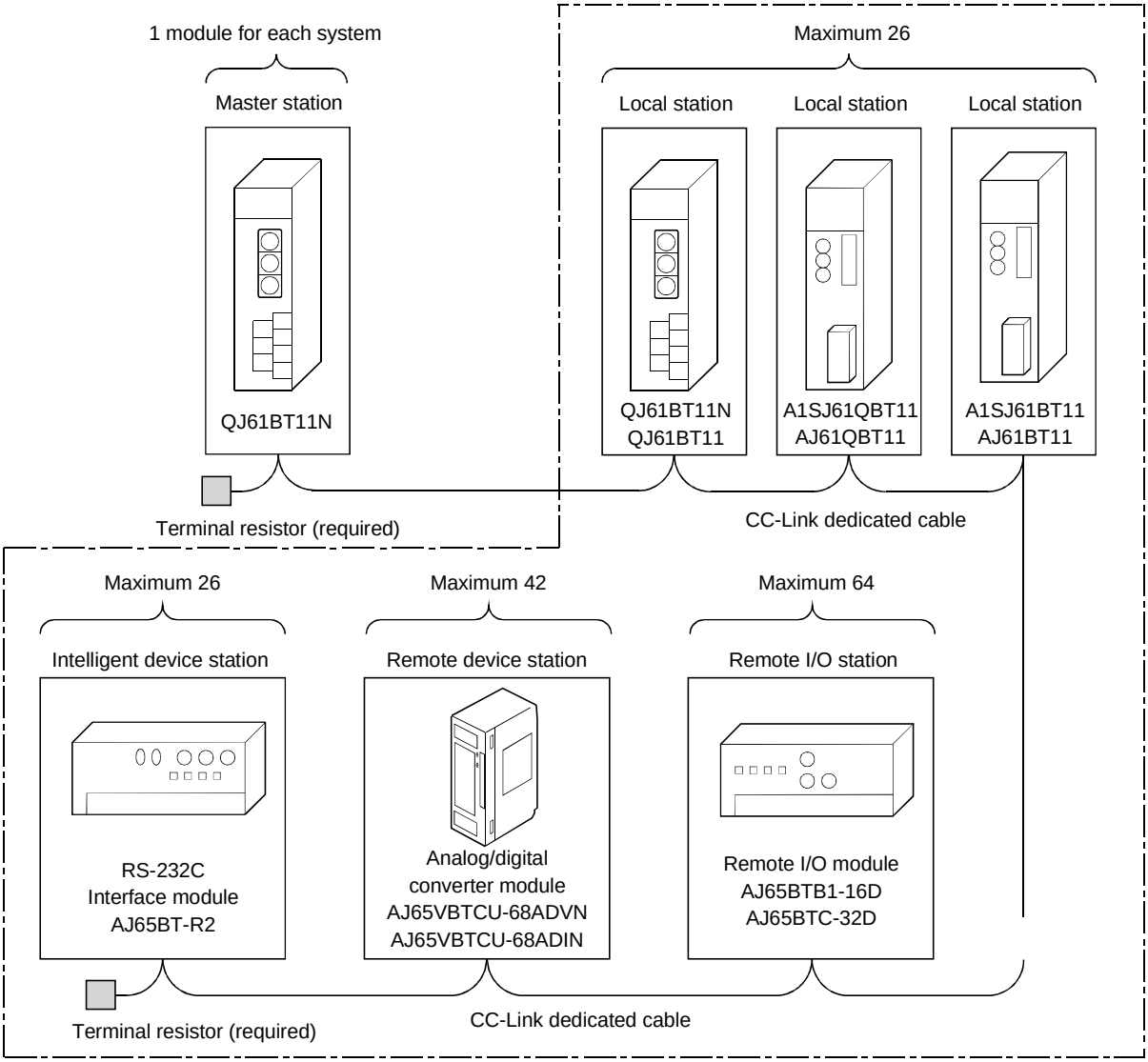


### (2) Remote net ver. 2 mode, remote net additional mode

A total of 64 remote I/O stations, remote device stations, local stations, standby master stations, or intelligent device stations can be connected to a single master station.
However, the following conditions must all be satisfied.

| | | |
|---|---|---|
| Condition 1 | {(a + a2 + a4 + a8)<br>+ (b + b2 + b4 + b8) × 2<br>+ (c + c2 + c4 + c8) × 3<br>+ (d + d2 + d4 + d8) × 4} ≦ 64 | a: The total number of ver.1 compatible slave stations that occupy 1 station, and ver.2 compatible slave stations that occupy 1 station which are set to “Single”.<br>b: The total number of ver.1 compatible slave stations that occupy 2 stations, and ver.2 compatible slave stations that occupy 2 stations which are set to “Single”.<br>c: The total number of ver.1 compatible slave stations that occupy 3 stations, and ver.2 compatible slave stations that occupy 3 stations which are set to “Single”.<br>d: The total number of ver.1 compatible slave stations that occupy 4 stations, and ver.2 compatible slave stations that occupy 4 stations which are set to “Single”.<br><br>a2: The number of ver.2 compatible stations that occupy 1 station which are set to “Double”.<br>b2: The number of ver.2 compatible stations that occupy 2 stations which are set to “Double”.<br>c2: The number of ver.2 compatible stations that occupy 3 stations which are set to “Double”.<br>d2: The number of ver.2 compatible stations that occupy 4 stations which are set to “Double”.<br><br>a4: The number of ver.2 compatible stations that occupy 1 station which are set to “Quadruple”.<br>b4: The number of ver.2 compatible stations that occupy 2 stations which are set to “Quadruple”.<br>c4: The number of ver.2 compatible stations that occupy 3 stations which are set to “Quadruple”.<br>d4: The number of ver.2 compatible stations that occupy 4 stations which are set to “Quadruple”.<br><br>a8: The number of ver.2 compatible stations that occupy 1 station which are set to “Octuple”.<br>b8: The number of ver.2 compatible stations that occupy 2 stations which are set to “Octuple”.<br>c8: The number of ver.2 compatible stations that occupy 3 stations which are set to “Octuple”.<br>d8: The number of ver.2 compatible stations that occupy 4 stations which are set to “Octuple”. |
| Condition 2 | [{(a × 32) + (a2 × 32) + (a4 × 64) + (a8 × 128)}<br>+ {(b × 64) + (b2 × 96) + (b4 × 192) + (b8 × 384)}<br>+ {(c × 96) + (c2 × 160) + (c4 × 320) + (c8 × 640)}<br>+ {(d × 128) + (d2 × 224) + (d4 × 448) + (d8 × 896)}] ≦ 8192 | |
| Condition 3 | [{(a × 4) + (a2 × 8) + (a4 × 16) + (a8 × 32)}<br>+ {(b × 8) + (b2 × 16) + (b4 ×+ 32) + (b8 × 64)}<br>+ {(c × 12) + (c2 × 24) + (c4 × 48) + (c8 × 96)}<br>+ {(d × 16) + (d2 × 32) + (d4 × 64) + (d8 × 128)}] ≦ 2048 | |
| Condition 4 | {(16 × A) + (54 × B) + (88 × C) } ≦ 2304 | A: Number of remote I/O stations ≦ 64<br>B: Number of remote device stations ≦ 42<br>C: Number of local stations, standby master stations and intelligent device stations ≦ 26 |


2 - 2


1 module for each system
Maximum 26
Master station
Local station
Local station
Local station
QJ61BT11N
QJ61BT11N
QJ61BT11
A1SJ61QBT11
AJ61QBT11
A1SJ61BT11
AJ61BT11
Terminal resistor (required)
CC-Link dedicated cable
Maximum 26
Maximum 42
Maximum 64
Intelligent device station
Remote device station
Remote I/O station
RS-232C
Interface module
AJ65BT-R2
Analog/digital
converter module
AJ65VBTCU-68ADVN
AJ65VBTCU-68ADIN
Remote I/O module
AJ65BTB1-16D
AJ65BTC-32D
Terminal resistor (required)
CC-Link dedicated cable
Total 64

## 2.2 Applicable System

Applicable PLC CPUs and notes on the system configuration are described below.

### 2.2.1 Applicable modules and number of CPUs that can be mounted

#### (1) Applicable modules and number of CPUs that can be mounted

The CPU modules and network modules (for remote I/O station) to which the QJ61BT11N can be installed and number of modules that can be installed are listed in the table below.

(a) When performing the parameter setting with the GX Developer

| Applicable module | | Number of CPUs that can be mounted | Remark |
|---|---|---|---|
| CPU module | Q00JCPU<br>Q00CPU<br>Q01CPU | Maximum 2 | (*1) (*2) |
| | Q02CPU<br>Q02HCPU<br>Q06HCPU<br>Q12HCPU<br>Q25HCPU | Maximum 4 | It can be mounted only with the Q mode.<br>(*1) (*3) |
| | Q12PHCPU<br>Q25PHCPU | Maximum 4 | (*1) (*6) |
| | Q12PRHCPU<br>Q25PRHCPU | Maximum 4 | (*1) (*4) (*5) |
| Network module | QJ72LP25-25<br>QJ72LP25G<br>QJ72BR15 | Maximum 4 | (*4) |

*1 Refer to the QCPU User's Manual (Function Explanation, Program Fundamentals).

*2 For use in the remote net additional mode, select a PLC CPU with first 5 digits of serial No. "06112" or later.
If any incompatible PLC CPU is used, the operation can not guaranteed.

*3 For use in the remote net additional mode, use a PLC CPU with first 5 digits of serial No. "05032" or later.
If any incompatible PLC CPU is used, the operation cannot be guaranteed.

*4 Incompatible with the remote net additional mode. When the module is used, the operation cannot be guaranteed.

*5 For use in a redundant system, select the QJ61BT11N with first 5 digits of serial No. "06052" or later.
When any incompatible QJ61BT11N is used, the operation cannot be guaranteed.

*6 For use in the remote net additional mode, use a PLC CPU with first 5 digits of serial No. "07032" or later.
If any incompatible PLC CPU is used, the operation cannot be guaranteed.

(b) When performing the parameter setting with the dedicated instructions.

| Applicable module | | Number of CPUs that can be mounted | Remark |
|---|---|---|---|
| CPU module | Q00JCPU<br>Q00CPU<br>Q01CPU | Maximum 2 | (*1) |
| | Q02CPU<br>Q02HCPU<br>Q06HCPU<br>Q12HCPU<br>Q25HCPU | Maximum 64 | It can be mounted only with the Q mode.<br>(*1) |
| | Q12PHCPU<br>Q25PHCPU | Maximum 64 | (*1) |

*1 Refer to the QCPU User's Manual (Function Explanation, Program Fundamentals).

## (2) Mountable base unit

QJ61BT11N can be mounted on any of the base unit's I/O slots (*7). However, depending on combinations with other mounted modules and the number of mountings, there may be cases where the power capacity is insufficient. Be sure to consider the power capacity when mounting the module.

*7 Must be inside the point number range of 1 CPU unit and network module (for remote I/O station).

## (3) Applicable software package

The software package available for the QJ61BT11N is listed below:

| Manual name | Model name | Remarks |
|---|---|---|
| GX Developer | SWnD5C-GPPW-E *8 | Required MELSEC PLC programming software.<br>"n" in the model name is 4 or greater. |

*8 The product of Version 8.03D or later is required for use in the remote net ver.2 mode or remote net additional mode.

## (4) Usable slave stations

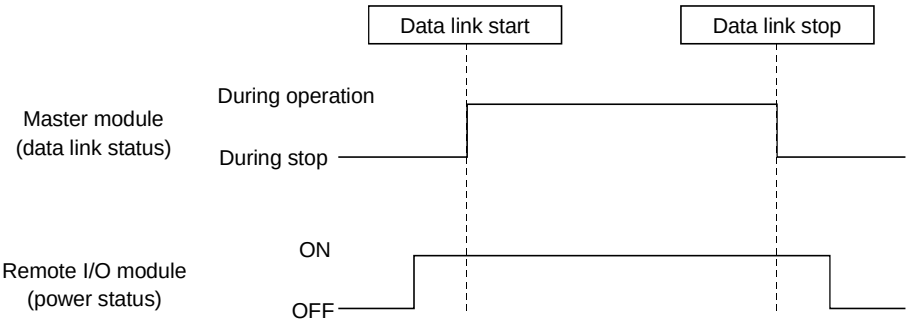
Any of ver.1 compatible slave stations and ver.2 compatible slave stations is usable.

## 2.2.2 Notes on the system configuration

The system should be designed with the following considerations to prevent mis-input from the remote I/O modules:

### (1) When powering on and off

Start the data link after turning on the power to the remote I/O modules. Turn off the power to the remote I/O modules after stopping the data link.




### (2) During momentary power failure of the remote I/O modules

When a momentary power failure occurs in the power (24 V DC) being supplied to the remote I/O modules, mis-input may occur.

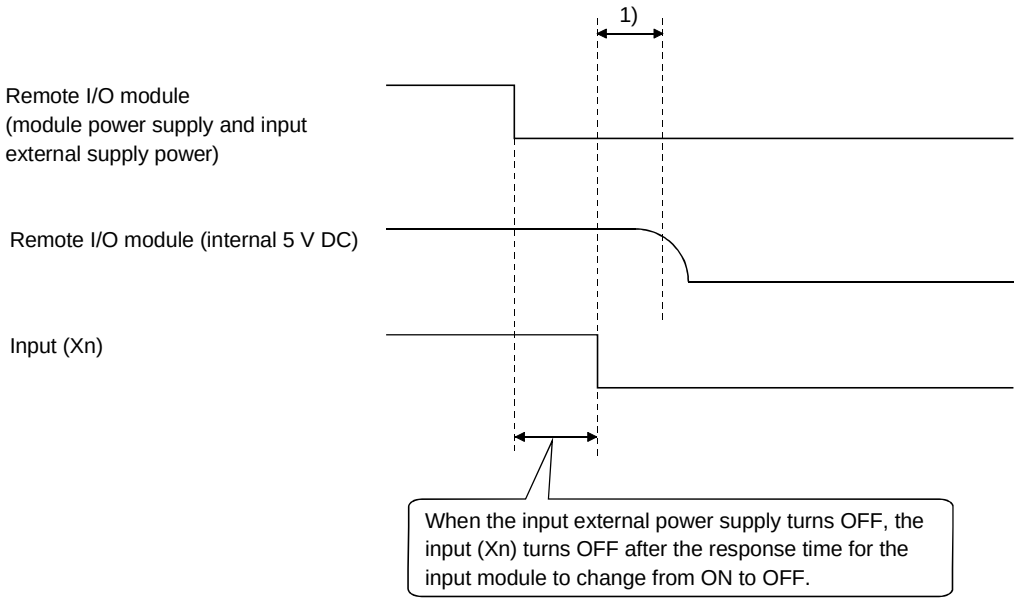
(a) Cause for mis-input due to a momentary power failure

The remote I/O module hardware uses the power by internally converting the module power (24 V DC) to 5 V DC.

When a momentary power failure occurs in a remote I/O module, the following condition occurs:

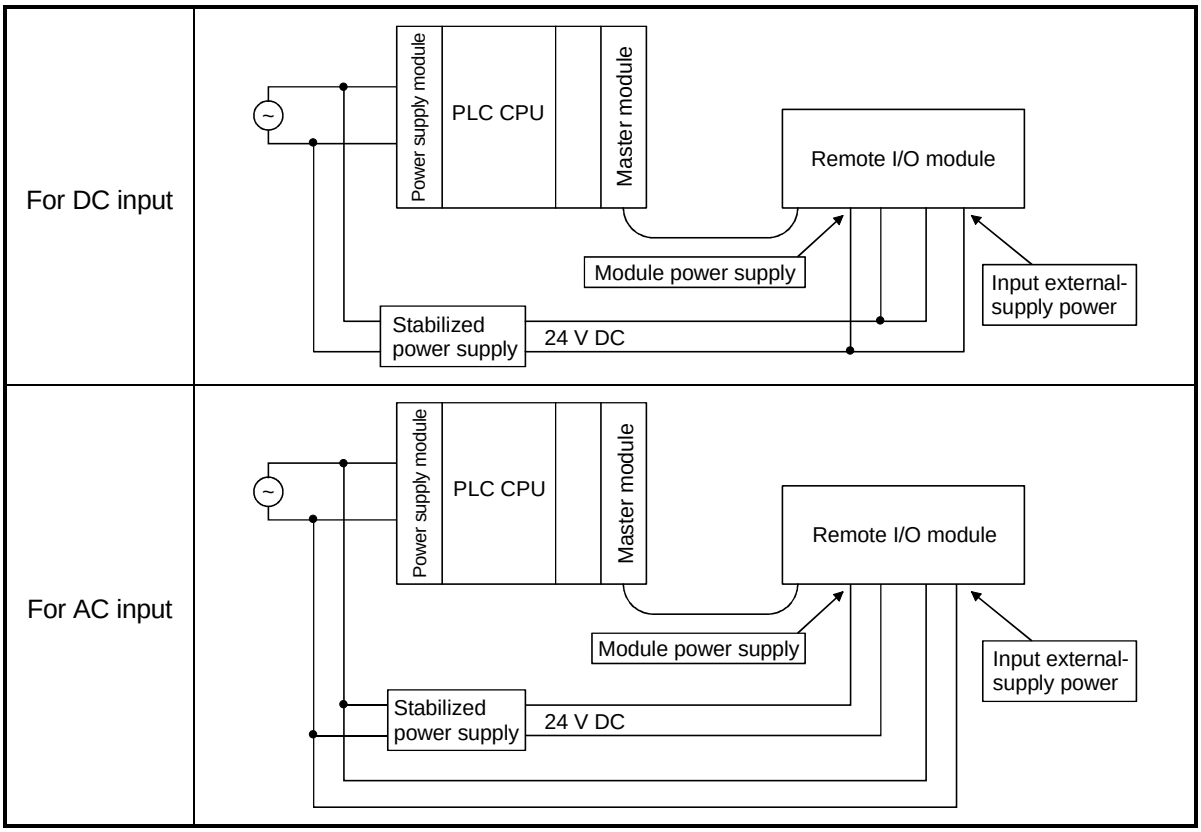
(Time for the 5 V DC power in the remote I/O module to turn off) > (Response time for input module on → off)

Therefore, mis-input occurs when a refresh is performed within the time indicated by 1) in the figure below.


1)
Remote I/O module
(module power supply and input
external supply power)
Remote I/O module (internal 5 V DC)
Input (Xn)
When the input external power supply turns OFF, the input (Xn) turns OFF after the response time for the input module to change from ON to OFF.

(b) Countermeasure for mis-input

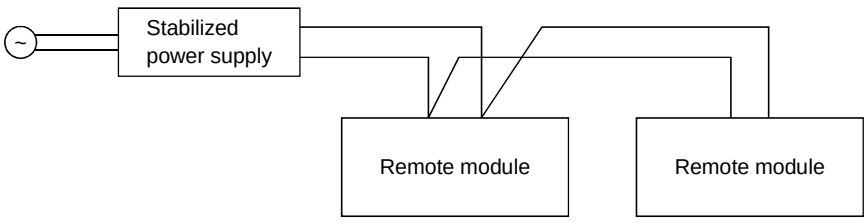
For the power supply module, the stabilized power supply and the input external supply power of AC input, wire the power cables from the same power source.




REMARK

When supplying power from a single power source to multiple remote I/O modules, select the proper type of cable and perform the wiring in consideration of the voltage decline.

Connections can be established if the receiving port voltage at the remote I/O module is within the specified range of the remote I/O module to be used.



(3) Access to station No.64

(a) To a local station of No. 64, other station access from GX Developer or GOT is not allowed.
If the station No. is changed to other than 64, other station access is executable.

(b) The CC-Link board is not allowed to access a local station or intelligent device station whose station No. is 64.
If the station No. is changed to other than 64, other station access is executable.

(4) Precautions for use on remote I/O stations

Pay attention to the following for use on remote I/O stations:

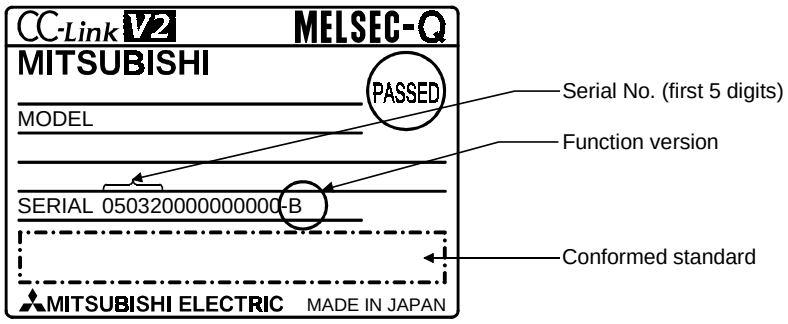
- Interrupt setting of network parameters is not available.
- Transient transmissions using dedicated instructions are not allowed to local stations and intelligent device stations.

## 2.2.3 How to check the function version

The following describes how to check the function version.

(1) How to check the function version of the QJ61BT11N

(a) Checking the "SERIAL column of the rating plate" on the module side




(b) See Section 13.4 for how to check the function version with GX Developer.

## 2.2.4 CC-Link version

There are two types of CC-Link version, i.e., Ver.1 and Ver.2.

### (1) Definition of Ver.1.00 and Ver.1.10

Version 1.10 modules have a uniform station-to-station cable length of 20 cm or more by improving the restrictions on the conventional station-to-station cable length.
In contrast, the conventional modules are defined as Version 1.00.
See Section 3.1.2 for the maximum overall cable distance of Version 1.10.
In order to make the station-to-station cable length uniformly 20 cm or more, the following conditions are required:

1) All the modules that configure the CC-Link system must be compatible with Ver.1.10.
2) All the data link cables must be CC-Link dedicated cables conforming to Version 1.10.

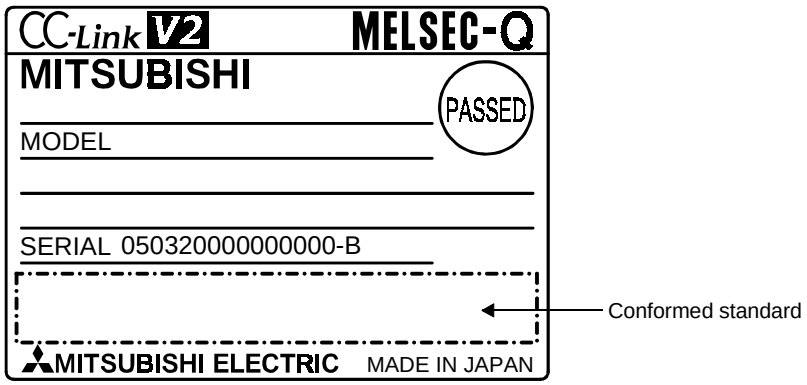
| POINT |
|---|
| The specifications for Version 1.00 should be used for the maximum cable overall distance and station-to-station cable length if a system contains modules and cables of both Version 1.00 and Version 1.10.<br>See Section 3.1.1 for the maximum overall cable distance and station-to-station cable length of Version 1.00. |

### (2) Definition of Ver.2

As Ver.2 is characterized as increase of cyclic transmission data size, Ver.2-compatible module is defined to support this function.

### (3) Checking version

The modules including CC-Link logo on the rated plate are compatible with Ver.1.10.
The modules including V2 logo on the rated plate are compatible with Ver.2.



# 3 SPECIFICATIONS

This section describes the specifications of the QJ61BT11N.
For the general specifications of the QJ61BT11N, refer to the user's manual for the CPU module to be used.

## 3.1 Performance Specifications

Table 3.1 lists the performance specifications of the OJ61BT11N.



Table 3.1 Performance specifications

| Item | Specification |
|---|---|
| Transmission rate | Can select from 156 kbps/ 625 kbps/ 2.5 Mbps/ 5 Mbps/ 10 Mbps |
| Maximum overall cable distance (Maximum transmission distance) | Varies according to the transmission rate (See Section 3.1.1, 3.1.2) |
| Maximum number of connected stations (master station) | 64 (See Section 2.1) |
| Number of occupied stations (local station) | 1 to 4 stations<br>The number of stations can be switched using the GX Developer parameter setting. ＊1 |
| Maximum number of link points per system ＊1 | Remote I/O (RX, RY) : 2048 points<br>Remote register (RWw) : 256 points (master station → remote device station/local station/ intelligent device station/standby master station)<br>Remote register (RWr) : 256 points (remote device station/local station/ intelligent device station/standby master station → master station) |
| Remote station/local station/intelligent device station/standby master station<br>Number of link points per station ＊1 | Remote I/O (RX, RY) : 32 points (local station is 30 points)<br>Remote register (RWw) : 4 points (master station → remote device station/local station/ intelligent device station/standby master station)<br>Remote register (RWr) : 4 points (remote device station/local station/ intelligent device station/standby master station → master station) |
| Communication method | Broadcast polling method |
| Synchronous method | Flag synchronous method |
| Encoding method | NRZI method |
| Transmission path | Bus (RS-485) |
| Transmission format | Conforms to HDLC |
| Error control system | CRC ($X^{16} + X^{12} + X^5 + 1$) |
| Connection cable | CC-Link dedicated cable/ CC-Link dedicated high-performance cable/<br>Ver.1.10 compatible CC-Link dedicated cable ＊2 |
| RAS function | • Automatic return function<br>• Slave station cut-off function<br>• Error detection by the link special relay/register |
| Number of I/O occupied points | 32 points (I/O assignment: Intelligent 32 points) |
| 5 V DC internal current consumption | 0.46 A |
| Weight | 0.12 kg |

＊1 Indicates the number of link points for remote net ver.1 mode. For number of link points for remote net ver.2 mode/remote net additional mode. Refer to the table 3.2.

＊2 CC-Link dedicated high-performance cables cannot be used with other cables such as CC-Link dedicated cables or Ver.1.10 compatible CC-Link dedicated cables. Also attach the terminating resister which matches the kind of the cable. (Refer to section 7.5)

Table 3.2 Number of link points for remote net ver.2 mode/remote net additional mode

| Item | | | Specifications | | | |
|---|---|---|---|---|---|---|
| Maximum No. of link points per system | | | Remote I/O (RX, RY) : 8192 points<br>Remote register (RWw) : 2048 points (master station → remote device station/local station/intelligent device station/standby master station)<br>Remote register (RWr) : 2048 points (remote device station/local station/intelligent device station/standby master station → master station) | | | |
| No. of link points per station | Expanded cyclic setting | | Single | Double | Quadruple | Octuple |
| | Remote I/O (RX, RY) | | 32 points (30 points for local station) | 32 points (30 points for local station) | 64 points (62 points for local station) | 128 points (126 points for local station) |
| | Remote register (RWw) | | 4 points | 8 points | 16 points | 32 points |
| | Remote register (RWr) | | 4 points | 8 points | 16 points | 32 points |
| Number of link points per number of occupied stations | Occupies 1 station | Remote I/O (RX, RY) | 32 points | 32 points | 64 points | 128 points |
| | | Remote register (RWw) | 4 points | 8 points | 16 points | 32 points |
| | | Remote register (RWr) | 4 points | 8 points | 16 points | 32 points |
| | Occupies 2 stations | Remote I/O (RX, RY) | 64 points | 96 points | 192 points | 384 points |
| | | Remote register (RWw) | 8 points | 16 points | 32 points | 64 points |
| | | Remote register (RWr) | 8 points | 16 points | 32 points | 64 points |
| | Occupies 3 stations | Remote I/O (RX, RY) | 96 points | 160 points | 320 points | 640 points |
| | | Remote register (RWw) | 12 points | 24 points | 48 points | 96 points |
| | | Remote register (RWr) | 12 points | 24 points | 48 points | 96 points |
| | Occupies 4 stations | Remote I/O (RX, RY) | 128 points | 224 points | 448 points | 896 points |
| | | Remote register (RWw) | 16 points | 32 points | 64 points | 128 points |
| | | Remote register (RWr) | 16 points | 32 points | 64 points | 128 points |

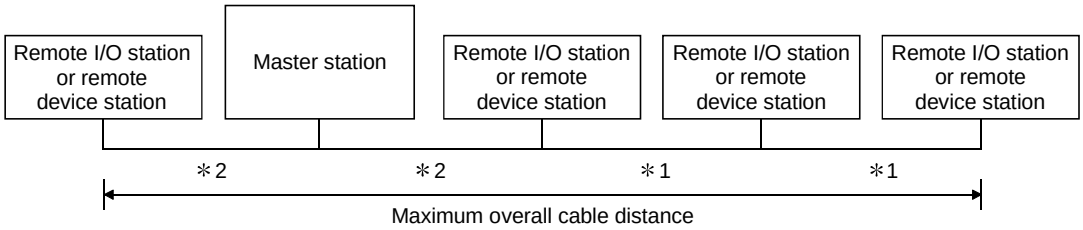



3 - 2

### 3.1.1 Maximum overall cable distance (for Ver. 1.00)

The relationship between the transmission speed and the maximum overall cable distance is described below:

#### (1) For a system consisting of only remote I/O stations and remote device stations




∗1 Cable length between remote I/O stations or remote device stations.

∗2 Cable length between the master station and the adjacent stations.

CC-Link dedicated cable (uses terminal resistor 110 Ω)

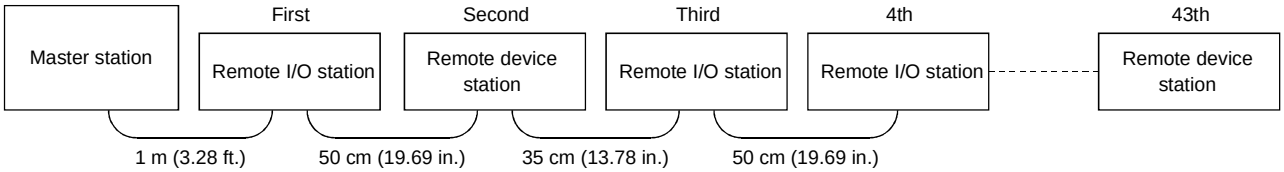
| Transmission rate | Station-to-station cable length | | Maximum overall cable distance |
|---|---|---|---|
| | ∗1 | ∗2 | |
| 156 kbps | 30 cm (11.81 in.) or more | 1 m (3.28 ft.) or more | 1200 m (3937.2 ft.) |
| 625 kbps | | | 600 m (1968.6 ft.) |
| 2.5 Mbps | | | 200 m (656.2 ft.) |
| 5 Mbps | 30 cm (11.81 in.) to 59 cm (23.23 in.) ∗ | | 110 m (360.9 ft.) |
| | 60 cm (23.62 in.) or more | | 150 m (492.15 ft.) |
| 10 Mbps | 30 cm (11.81 in.) to 59 cm (23.23 in.) ∗ | | 50 m (164.1 ft.) |
| | 60 cm (23.62 in.) to 99 cm (38.98 in.) ∗ | | 80 m (262.5 ft.) |
| | 1 m (3.28 ft.) or more | | 100 m (328.1 ft.) |

CC-Link dedicated high performance cable (uses terminal resistor 130 Ω)

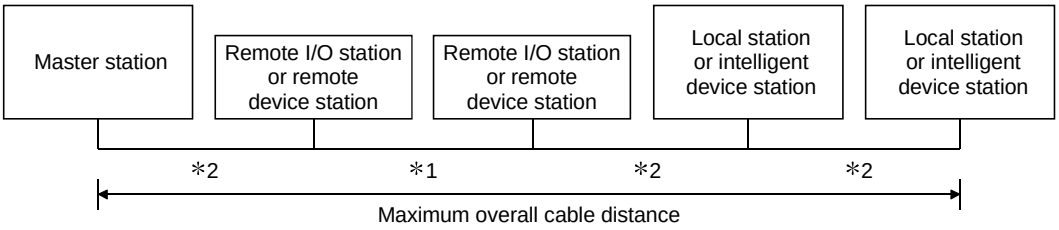
| Transmission rate | | Station-to-station cable length | | Maximum overall cable distance |
|---|---|---|---|---|
| | | ∗1 | ∗2 | |
| 156 kbps | | 30 cm (11.81 in.) or more | 1 m (3.28 ft.) or more | 1200 m (3937.2 ft.) |
| 625 kbps | | | | 900 m (2952.9 ft.) |
| 2.5 Mbps | | | | 400 m (1312.4 ft.) |
| 5 Mbps | | | | 160 m (524.96 ft.) |
| 10 Mbps | Number of connected stations: 1 to 32 | | | 100 m (328.1 ft.) |
| | Number of connected stations: 33 to 48 | 30 cm (11.81 in.) to 39 cm (15.35 in.) ∗ | | 80 m (262.5 ft.) |
| | | 40 cm (15.75 in.) or more | | 100 m (328.1 ft.) |
| | Number of connected stations: 49 to 64 | 30 cm (11.81 in.) to 39 cm (15.35 in.) ∗ | | 20 m (65.52 ft.) |
| | | 40 cm (15.75 in.) to 69 cm (27.17 in.) ∗ | | 30 m (98.43 ft.) |
| | | 70 cm (27.56 in.) or more | | 100 m (328.1 ft.) |

∗ The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the maximum overall cable distance will be as indicated above.

(Example) When the transmission rate is 10 Mbps, and 43 remote I/O stations and remote device stations are connected using the CC-Link dedicated high performance cable, because the cable connecting the second and third stations is "35 cm (13.78 in.)", the maximum overall cable distance will be "80 cm (31.5 in.)".




(2) For a system consisting of remote I/O stations, remote device stations, local stations and intelligent device stations




∗1 Cable length between remote I/O stations or remote device stations

∗2 Cable length between the master station or the local or intelligent device station and the adjacent stations

CC-Link dedicated cable (uses terminal resistor 110 Ω)

| Transmission rate | Station-to-station cable length | | Maximum overall cable distance |
|---|---|---|---|
| | ∗1 | ∗2 | |
| 156 kbps | 30 cm (11.81 in.) or more | 2 m (6.56 ft.) or more | 1200 m (3937.2 ft.) |
| 625 kbps | | | 600 m (1968.6 ft.) |
| 2.5 Mbps | | | 200 m (656.2 ft.) |
| 5 Mbps | 30 cm (11.81 in.) to 59 cm (23.23 in.) ∗ | | 110 m (360.9 ft.) |
| 10 Mbps | 60 cm (23.62 in.) or more | | 150 m (492.15 ft.) |
| | 30 cm (11.81 in.) to 59 cm (23.23 in.) ∗ | | 50 m (164.1 ft.) |
| | 60 cm (23.62 in.) to 99 cm (38.98 in.) ∗ | | 80 m (262.5 ft.) |
| | 1 m (3.28 ft.) or more | | 100 m (328.1 ft.) |

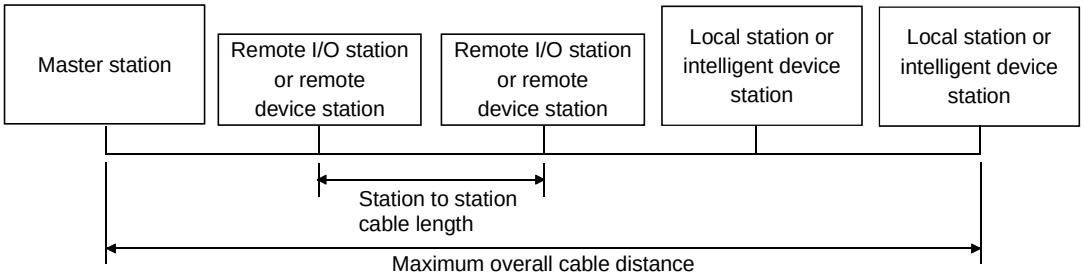
CC-Link dedicated high performance cable (uses terminal resistor 130 Ω)

| Transmission rate | Station-to-station cable length | | Maximum overall cable distance |
|---|---|---|---|
| | ∗1 | ∗2 | |
| 156 kbps | 30 cm (11.81 in.) or more | 2 m (6.56 ft.) or more | 1200 m (3937.2 ft.) |
| 625 kbps | | | 600 m (1968.6 ft.) |
| 2.5 Mbps | | | 200 m (656.2 ft.) |
| 5 Mbps | 30 cm (11.81 in.) to 59 cm (23.23 in.) ∗ | | 110 m (360.9 ft.) |
| | 60 cm (23.62 in.) or more | | 150 m (492.15 ft.) |
| 10 Mbps | 70 cm (27.56 in.) to 99 cm (38.98 in.) ∗ | | 50 m (164.1 ft.) |
| | 1 m (3.28 ft.) or more | | 80 m (262.5 ft.) |

∗ The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the maximum overall cable distance will be as indicated above.

### 3.1.2 Maximum overall cable distance (for Ver. 1.10)

The relation of the transmission speed and maximum overall cable distance when configuring the entire system with Version 1.10 modules and cable is shown below.


Master station
Remote I/O station or remote device station
Remote I/O station or remote device station
Local station or intelligent device station
Local station or intelligent device station
Station to station cable length
Maximum overall cable distance

Version 1.10 compatible CC-Link dedicated cable (terminal resistor of 110Ω used)

| Transmission speed | Station to station cable length | Maximum overall cable distance |
|---|---|---|
| 156kbps | 20cm or longer | 1200m |
| 625kbps | | 900m |
| 2.5Mbps | | 400m |
| 5Mbps | | 160m |
| 10Mbps | | 100m |

## 3.2 CC-Link Dedicated Cable

Use the CC-Link dedicated cable for the CC-Link system. If a cable other than the CC-Link dedicated cable is used, the performance of the CC-Link system cannot be guaranteed.
If you have any questions regarding the CC-Link dedicated cable, or if you wish to see its specifications, see the CC-Link Partner Association homepage http://www.cc-link.org/.

REMARK

For details, refer to the CC-Link cable wiring manual issued by CC-Link Partner Association.

# MEMO


3 - 7

# 4 FUNCTIONS

This chapter explains the functions of QJ61BT11N, dividing them into four sections: "Basic Functions", "Functions for Improving System Reliability", "Handy Functions" and "Transient Transmission Functions".
Some functions are unavailable depending on the mounted CPU.
Refer to Appendix 6 for details.

## 4.1 Function List

(1) Table 4.1 lists the "basic functions".

Table 4.1 List of the "basic functions"

| Item | Description | Reference section |
|---|---|---|
| Communication with remote I/O station | Performs on/off data communication with remote I/O station. | Section 4.2.1 |
| Communication with remote device station | Performs on/off data and numeric data communication with remote device station. | Section 4.2.2 |
| Communication with local station | Performs on/off data and numeric data communication with local station. | Section 4.2.3 |
| Communication with intelligent device station | Performs communication with intelligent device station, cyclic transmission, and transient transmission. | Section 4.2.4 |
| Parameter setting with GX Developer | Sets the network parameter, automatic refresh parameter with the GX Developer. | Section 4.2.5 |
| Parameter setting with dedicated instruction | Sets the network parameter with the RLPASET instruction. | Section 4.2.6 |

(2) Table 4.2 lists the "functions for improving system reliability".

Table 4.2 List of the "functions for improving system reliability"

| Item | Description | Reference section |
|---|---|---|
| Slave station cut-off function | Disconnects the module that cannot continue the data link because of power off, and continues the data link with only the normal modules. | Section 4.3.1 |
| Automatic return function | When a module, which has been disconnected from the data link because of power off, returns to the normal status, it automatically joins the data link. | Section 4.3.2 |
| Data link status setting when the master station PLC CPU has an error | Sets the data link status when an error that stops the operation occurs at the master station PLC CPU. | Section 4.3.3 |
| Setting the status of input data from a data link faulty station | Sets the status (clear/hold) of the input (receive) data from a station that became data link faulty because of power off. | Section 4.3.4 |
| Slave station refresh/compulsory clear setting in case of PLC CPU STOP | Sets whether output data to the slave stations will be refreshed or compulsorily cleared when the PLC CPU comes to STOP. | Section 4.3.5 |
| Standby master function | Continues the data link by switching to the standby master station when a problem occurs in the master station. | Section 4.3.6 |

(3) Table 4.3 lists the "handy functions".

Table 4.3 List of the "handy functions"

| Item | Description | | Reference section |
|---|---|---|---|
| Remote device station initialization procedure registration function | Performs initial setting of remote device station using GX Developer. | | Section 4.4.1 |
| Event issuance for the interrupt program | Issues events when the conditions set by GX Developer are established and causes the PLC CPU to run an interrupt program. | | Section 4.4.2 |
| Automatic CC-Link startup | Starts the CC-Link automatically by turning the power on. | | Section 4.4.3 |
| Remote net mode | Performs communication with all stations (remote station, local station, intelligent device station, and standby master station). | | Section 4.4.4 |
| Remote I/O net mode | Shortens the link scan time for a system consisting only of the master station and remote I/O stations. | | Section 4.4.5 |
| Reserved station function | By assigning modules that will be connected in the future as reserved stations, they will not be treated as data link faulty stations. If any of the connected modules is specified, it cannot perform data link.<br>The reserved stations can also be set as 0 points. | | Section 4.4.6 |
| Error invalid station setting function | Prevents modules that may be powered off in the system configuration from being treated as data link faulty stations by setting the network parameters. | | Section 4.4.7 |
| Scan synchronous function | Synchronous mode | Performs link scan by synchronizing with sequence scan. | Section 4.4.8 |
| | Asynchronous mode | Perform link scan without synchronizing with sequence scan. | |
| Temporary error invalid station setting function | Prevents modules specified by GX Developer from being treated as data link faulty stations temporarily during online operation. | | Section 4.4.9 |
| Data link stop/restart | Stops or restarts the data link that is being executed. | | Section 4.4.10 |
| Station number overlap checking function | Checks for the overlapping of number of occupied stations and whether or not more than one module having a station number setting of 0 exists in the system. | | Section 4.4.11 |
| Multiple PLC system support | Allows monitoring and reading/writing programs from/to any CPU in a multiple PLC system mounted with the QJ61BT11N via AJ65BT-G4-S3 or other station CPUs. | | Section 4.4.12 |
| Remote I/O station points setting | Allows the I/O points of the remote I/O stations to be selected from among 8 points, 16 points and 32 points, reducing the number of reserved points. | | Section 4.4.13 |
| Cyclic points increase | Allows the number of cyclic points per module to be increased from 128 points for RX/RY and 16 points for RWr/RWw in the ver. 1 mode to up to 896 points for RX/RY and 128 points for RWr/RWw in the ver. 2 mode. | | Section 4.4.14 |

(4) Table 4.4 lists the "functions for transient transmission".

Table 4.4 List of the "functions for transient transmission"

| Item | Description | Reference section |
|---|---|---|
| Transient transmission | Specifies a counterpart and communicates at an arbitrary timing. | Section 4.5.1 |

## 4.2 Basic Functions

This section explains the basic functions of the QJ61BT11N.

### 4.2.1 Communication with the remote I/O stations

Two types of communication modes are available for the CC-Link system: remote net mode and remote I/O net mode.

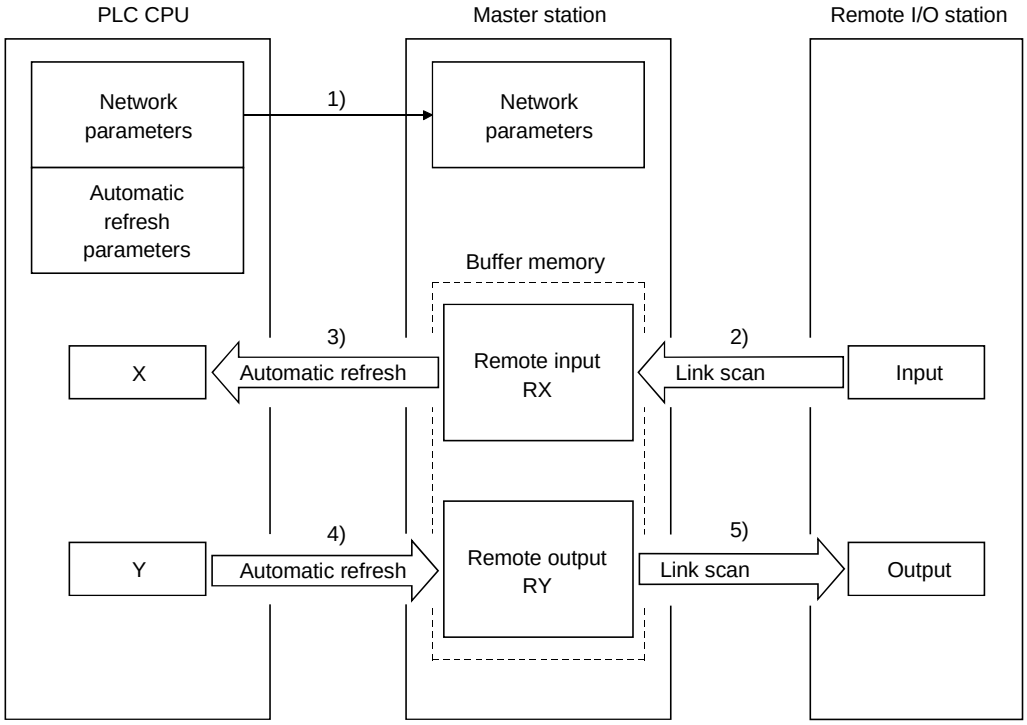
(1) Remote net mode

In this mode, it is possible to communicate with all stations (remote I/O station, remote device station, local station, intelligent device station, and standby master station). Thus, various systems can be configured according to their applications.

(2) Remote I/O net mode

In this mode, a high-speed cyclic transmission is performed for a system consisting only of the master station and remote I/O stations. Because of this, the link scan time can be shortened when compared to the remote net mode.

The following provides an overview of the communication between the master station and a remote I/O station using the remote I/O net mode. In the communication with the remote I/O station, the on/off data of the switches and indicator lamps are communicated through remote input RX and remote output RY.

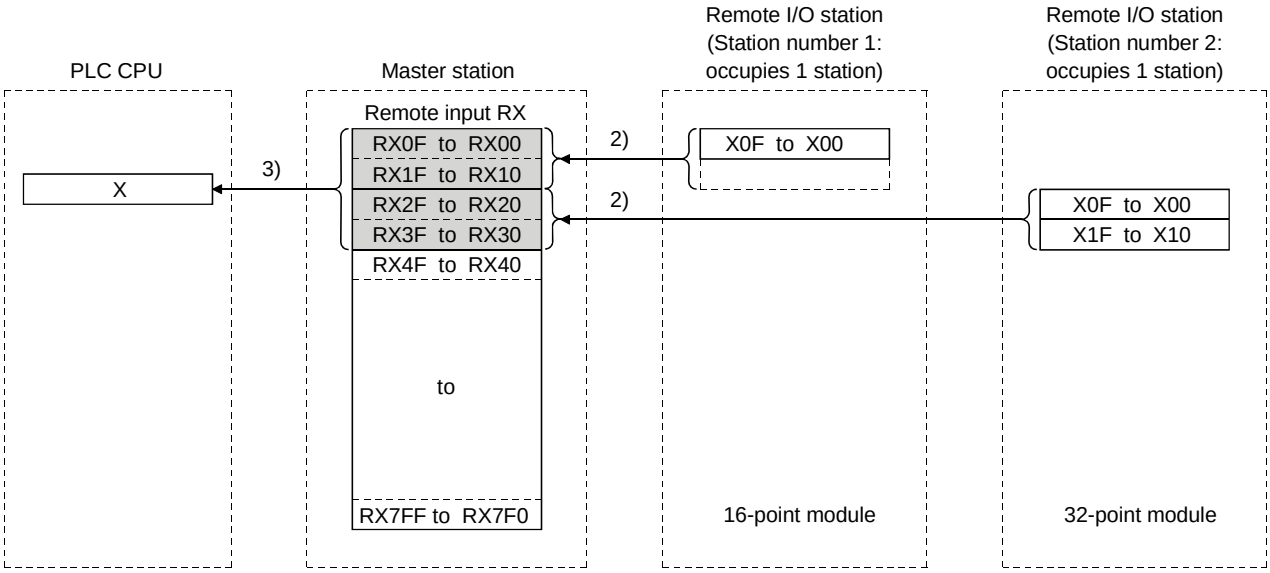



[Data link startup]

1) When the PLC system is powered on, the network parameters in the PLC CPU are transferred to the master station, and the CC-Link system automatically starts up.

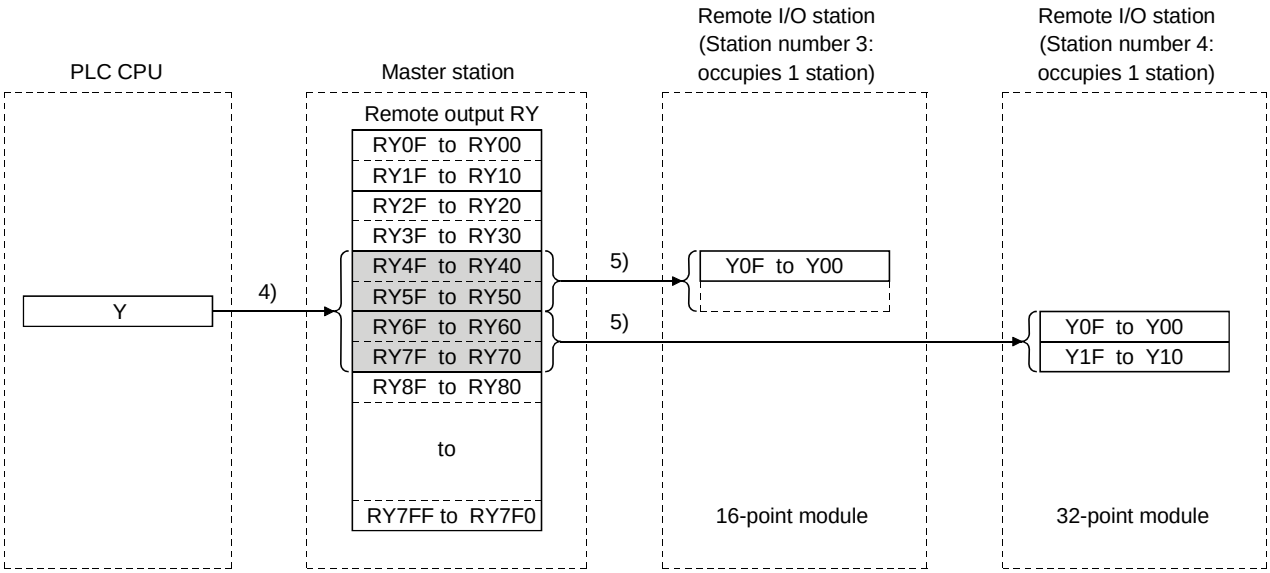
[Remote input]

2) The input status of a remote I/O station is stored automatically (for each link scan) in the master station's "remote input RX" buffer memory.
3) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters.




[Remote output]

4) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory.
5) The output status stored in the "remote output RY" buffer memory is output automatically (for each link scan) to remote I/O stations.

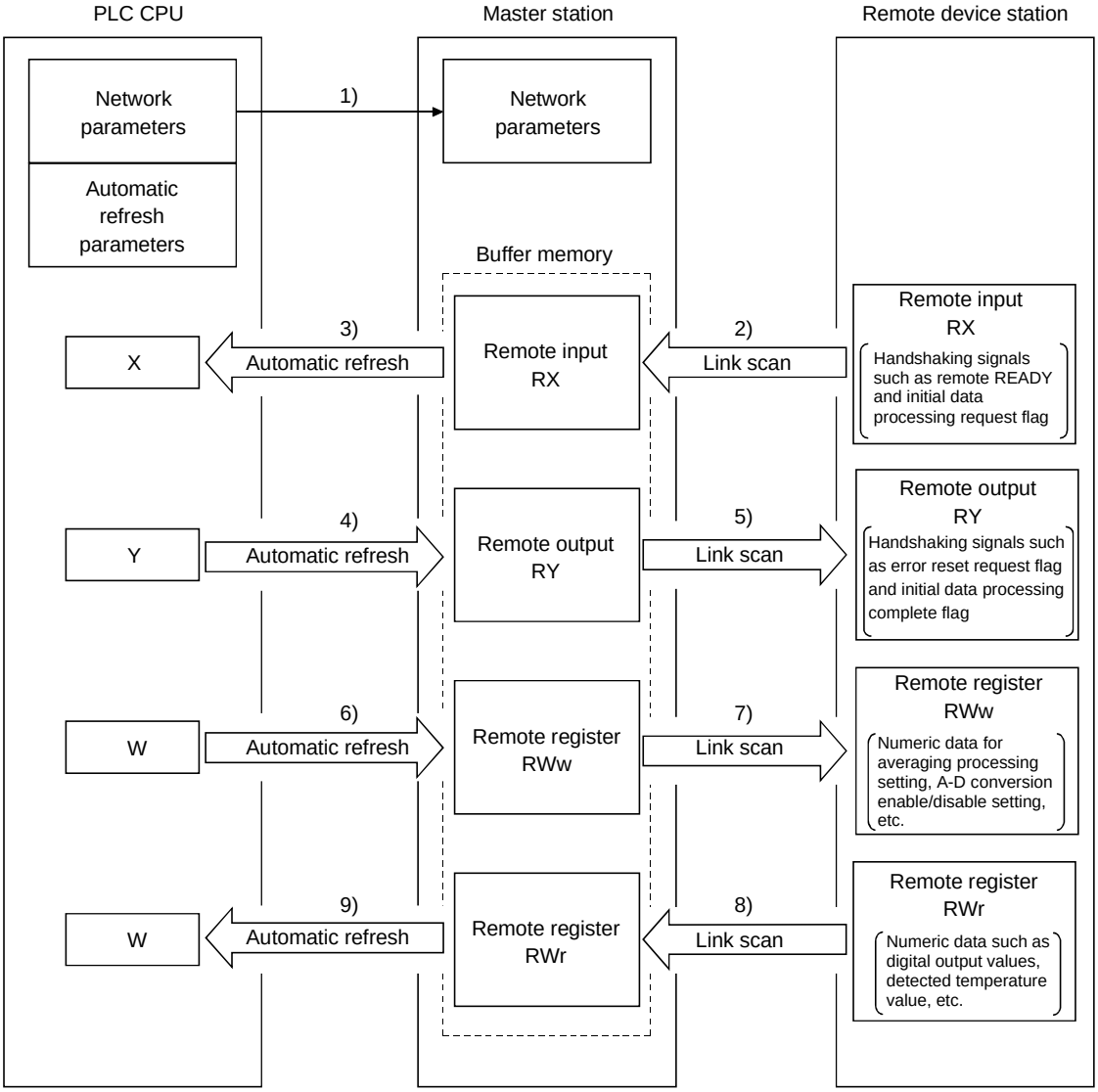



**DANGER**

- When setting the automatic refresh parameters, it is recommended to specify "Y" as the remote output RY refresh device. If any device other than "Y" (e.g. M or L) is specified, parameter setting must be made to compulsorily clear the device status at a CPU STOP. If parameter setting is not made, the device status before a STOP is retained as is. For slave station compulsory clear in case of CPU STOP, see Section 4.3.5. For the method to stop a data link, see Section 4.4.10.

## 4.2.2 Communication with the remote device stations

This section explains an overview of the communication between the master and the remote device stations.
In the communication with remote device stations, the signals for handshaking with remote device stations (initial data request flag, error reset request flag, etc.) are communicated using remote input RX and remote output RX. Numeric data (averaging processing specification, digital output value, etc.) is communicated using remote register RWw and remote register RWr.

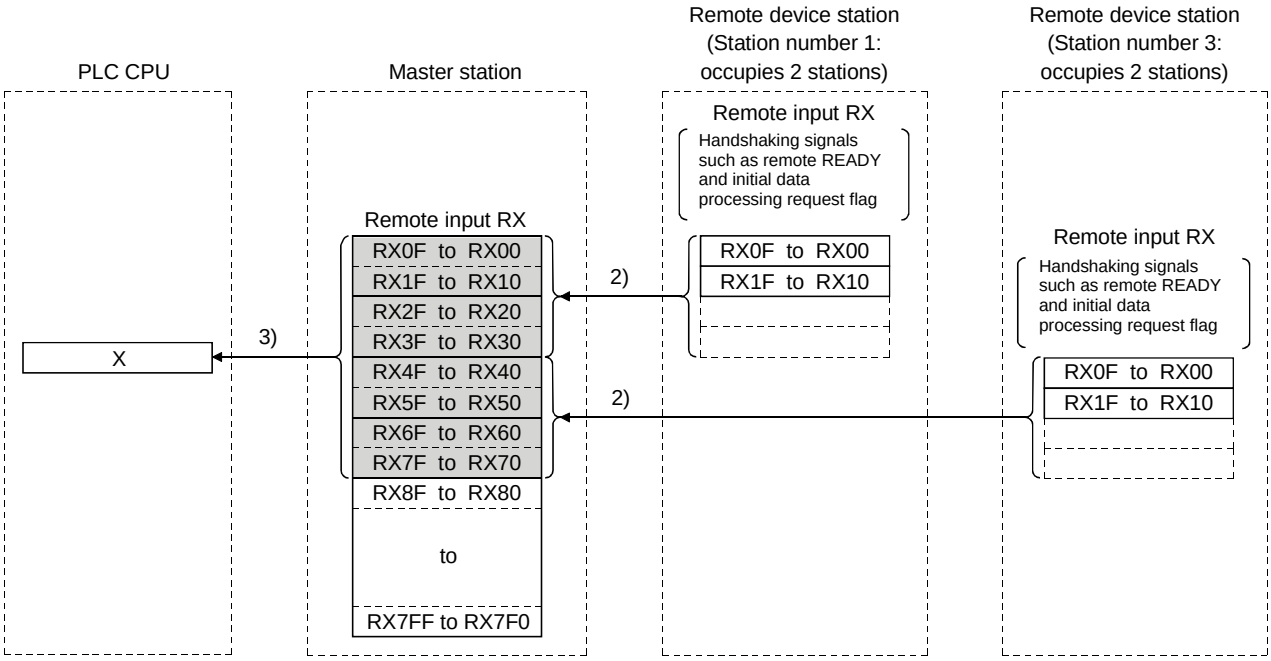


[Data link startup]

1) When the PLC system is powered on, the network parameters in the PLC CPU are transferred to the master station, and the CC-Link system automatically starts up.

[Remote input]

2) The remote input RX of a remote device station is stored automatically (for each link scan) in the master station's "remote input RX" buffer memory.
3) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters.

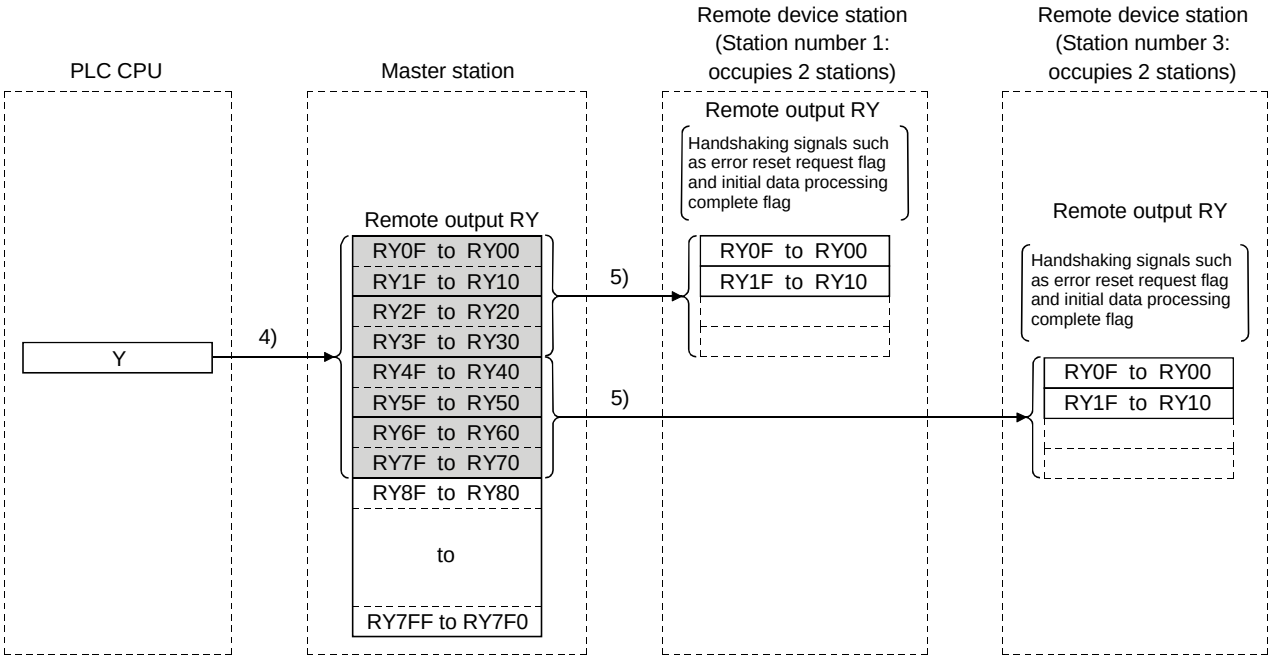



[Remote input RX when the AJ65BT-64AD is set to station number 1]

| Signal direction: AJ65BT-64AD → Master module | |
|---|---|
| Device No. | Signal name |
| RX00 | CH1 A-D conversion completed flag |
| RX01 | CH2 A-D conversion completed flag |
| RX02 | CH3 A-D conversion completed flag |
| RX03 | CH4 A-D conversion completed flag |
| RX04 to RX17 | Not used |
| RX18 | Initial data processing request flag |
| RX19 | Initial data setting complete flag |
| RX1A | Error status flag |
| RX1B | Remote READY |
| RX1C to RX1F | Not used |

[Remote output]

4) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory.
5) Remote output RY is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.



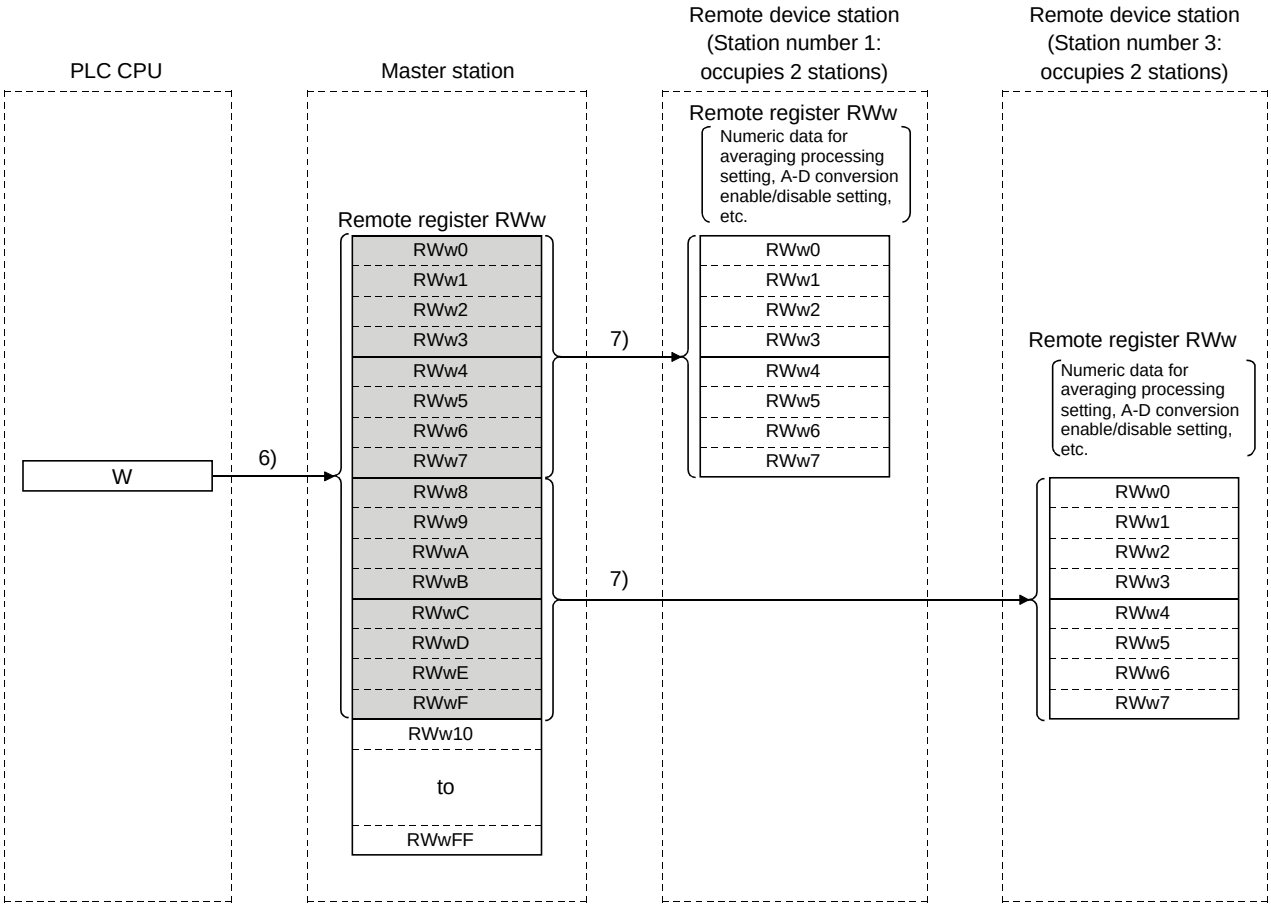

[Remote output RY when the AJ65BT-64AD is set to station number 1]

| Signal direction: Master module → AJ65BT-64AD | |
|---|---|
| Device No. | Signal name |
| RY00 | Selection of offset/gain values |
| RY01 | Selection of voltage/current |
| RY02<br>to<br>RY17 | Not used |
| RY18 | Initial data setting complete flag |
| RY19 | Initial data processing request flag |
| RY1A | Error reset request flag |
| RY1B<br>to<br>RY1F | Not used |

[Writing to the remote register RWw]

6) The transmission data of the CPU device set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory.

7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of each remote device station.




[Remote register RWw when the AJ65BT-64AD is set to station number 1]

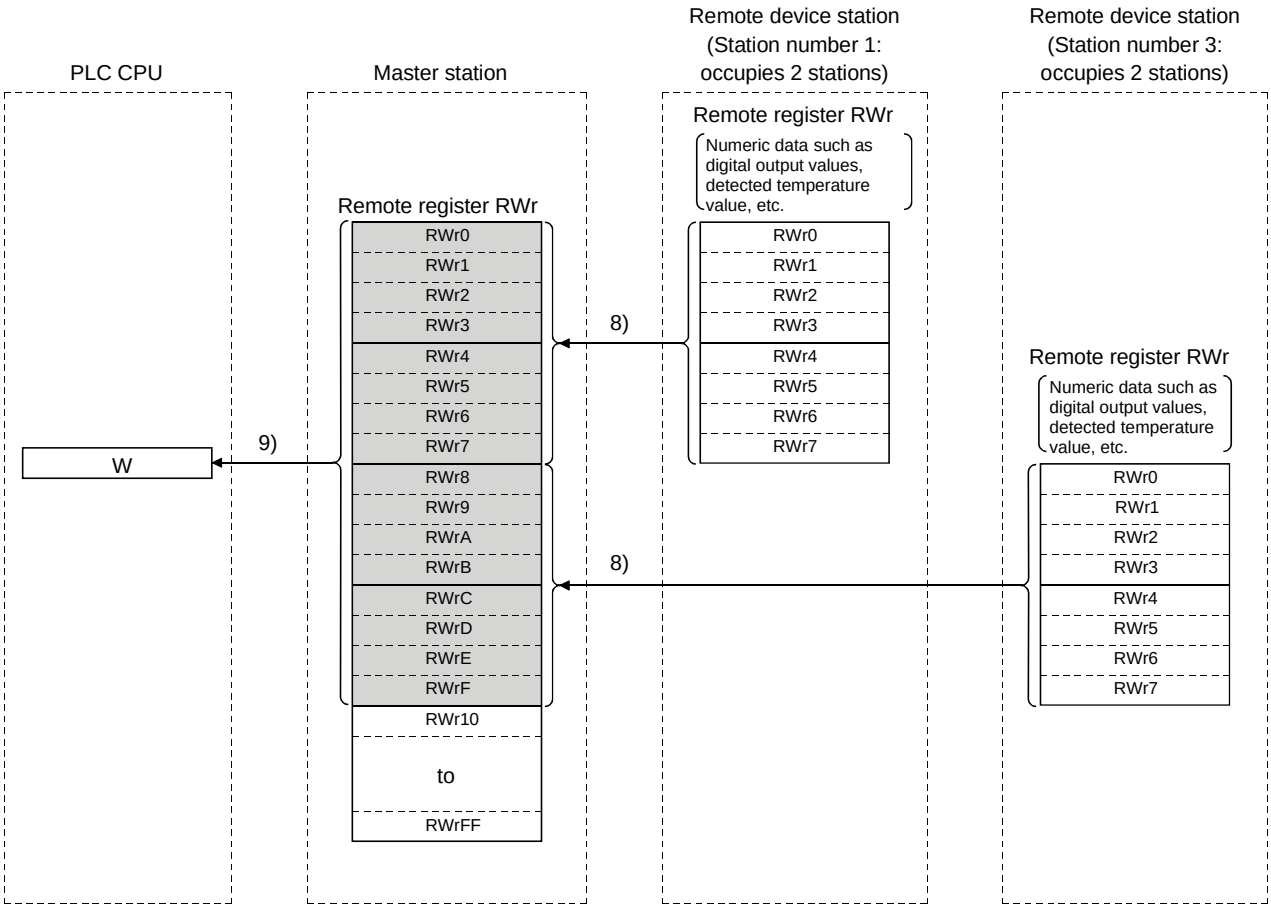
| Signal direction: master module → AJ65BT-64AD | |
|---|---|
| Address | Description |
| RWw0 | Averaging process setting |
| RWw1 | CH1 average time, number of times |
| RWw2 | CH2 average time, number of times |
| RWw3 | CH3 average time, number of times |
| RWw4 | CH4 average time, number of times |
| RWw5 | Data format |
| RWw6 | A-D conversion enable/disable setting |
| RWw7 | Not used |

* The data content to be written to the remote registers RWw0 to RWwn is predefined for each remote device station.

[Reading from the remote register (RWr)]

8) The remote register RWr data of a remote device station is automatically stored in the "remote register Rwr" buffer memory of the master station.

9) The remote register RWr data of a remote device station stored in the "remote register RWr" buffer memory is stored in the CPU device set with the automatic refresh parameters.




[Remote register RWr when the AJ65BT-64AD is set to station number 1]

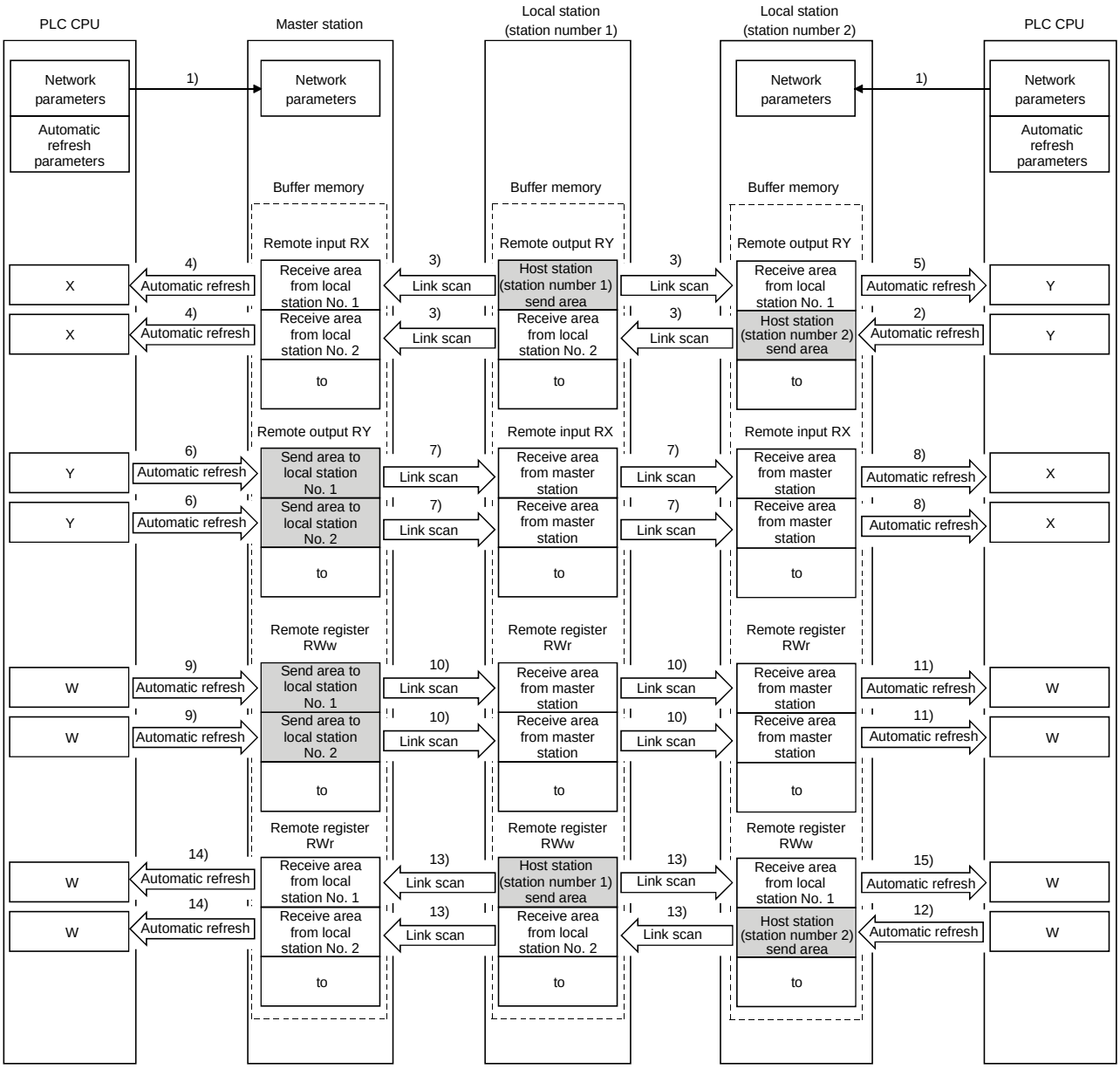
| Signal direction: AJ65BT-64AD → Master module | |
|---|---|
| Address | Description |
| RWw0 | CH1 digital output value |
| RWw1 | CH2 digital output value |
| RWw2 | CH3 digital output value |
| RWw3 | CH4 digital output value |
| RWw4 | Error code |
| RWw5 | Not used |
| RWw6 | |
| RWw7 | |

## 4.2.3 Communication with the local stations

This section explains an overview of the communication between the master and local stations.

### (1) Communication between the master and local stations by cyclic transmission

Data communication between PLC CPUs can be performed in N:N mode using remote input RX and remote output RY (bit data used in local station systems) as well as remote register RWw and remote register RWr (word data for writing and reading used in local station systems).





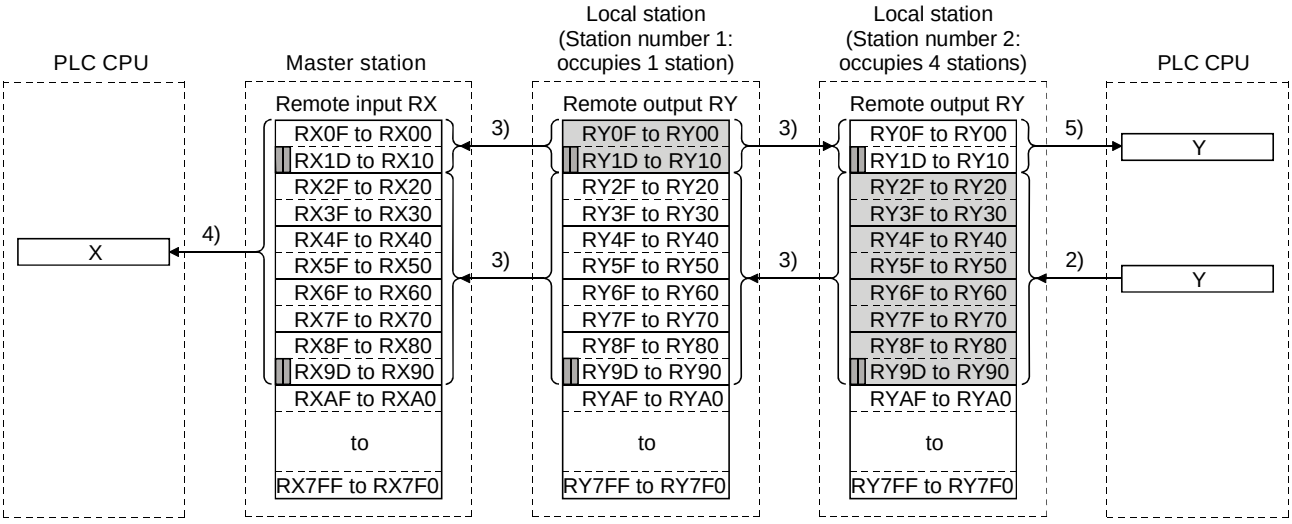
4 - 10

[Data link startup]

1) When the PLC system is powered on, the network parameters in the PLC CPU are transferred to the master station and the CC-Link system starts up automatically.

[On/off data from a local station to the master station or other local stations]

2) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory of the local station. The remote output RY is used as output data in local station systems.
3) The data in the "remote output RY" buffer memory of the local station is automatically stored (for each link scan) in the "remote input RX" buffer memory of the master station and the "remote output RY" buffer memory of other local stations.
4) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters. The remote input RX is used as input data in local station systems.
5) The input status stored in the "remote output RY" buffer memory is stored in the CPU device set with the automatic refresh parameters.



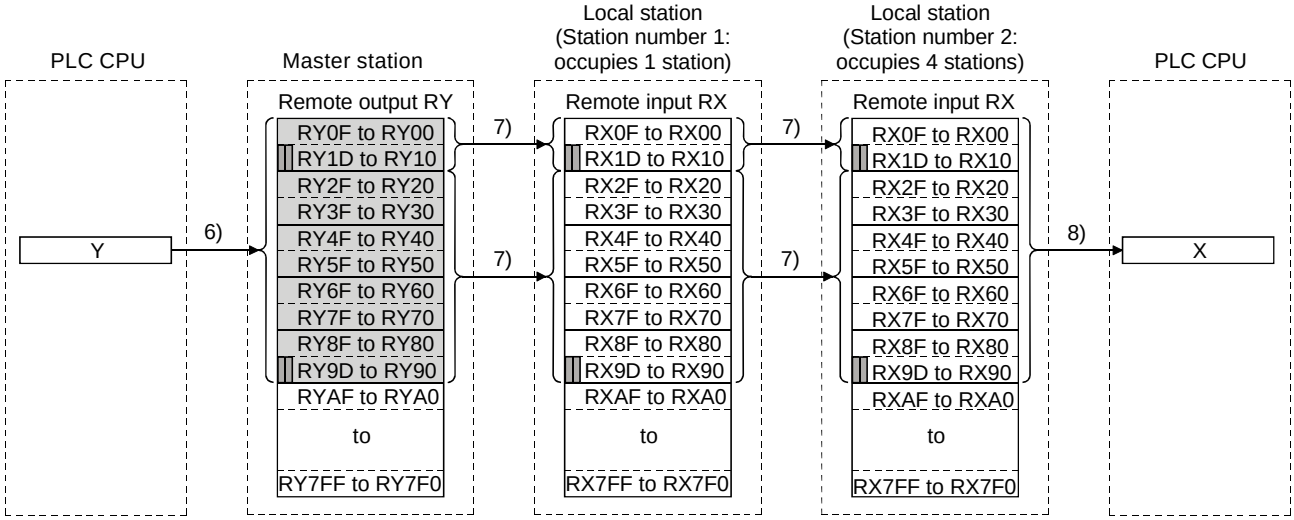

The last two bits cannot be used in the communication between the master and local stations.

[On/off data from the master station to local stations]

6) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory of the master station.

7) The data in the "remote output RY" buffer memory is stored automatically (for each link scan) in the "remote input RX" buffer memory of the local station.

8) The input status stored in the buffer memory "remote input RX" is stored in the CPU device set with the automatic refresh parameters.




---- The last two bits cannot be used in the communication between the master and local stations.

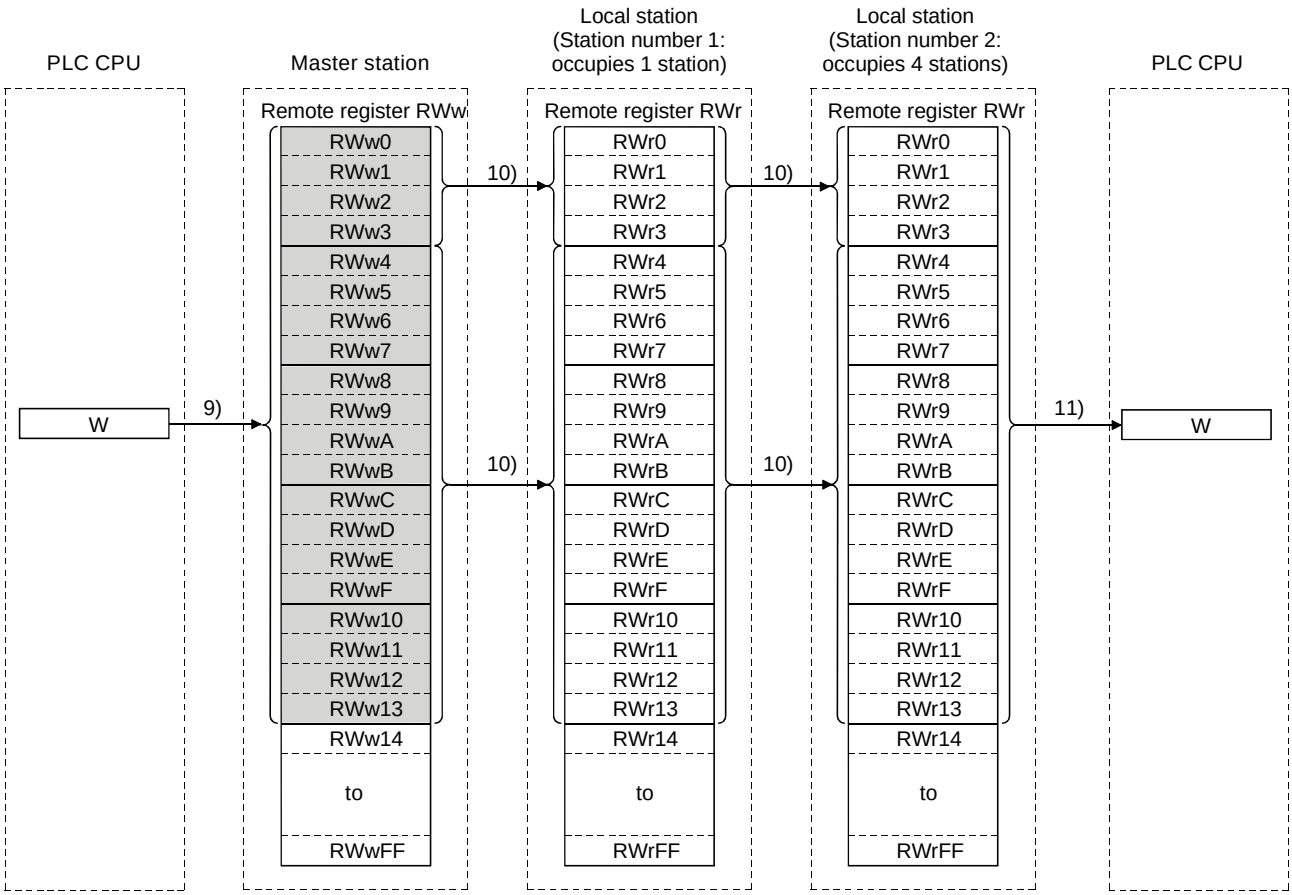

4 - 12

[Word data from the master station to all local stations]

9) The word data of the CPU device set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory of the master station. The remote register RWw is used as word data for writing in local station systems.

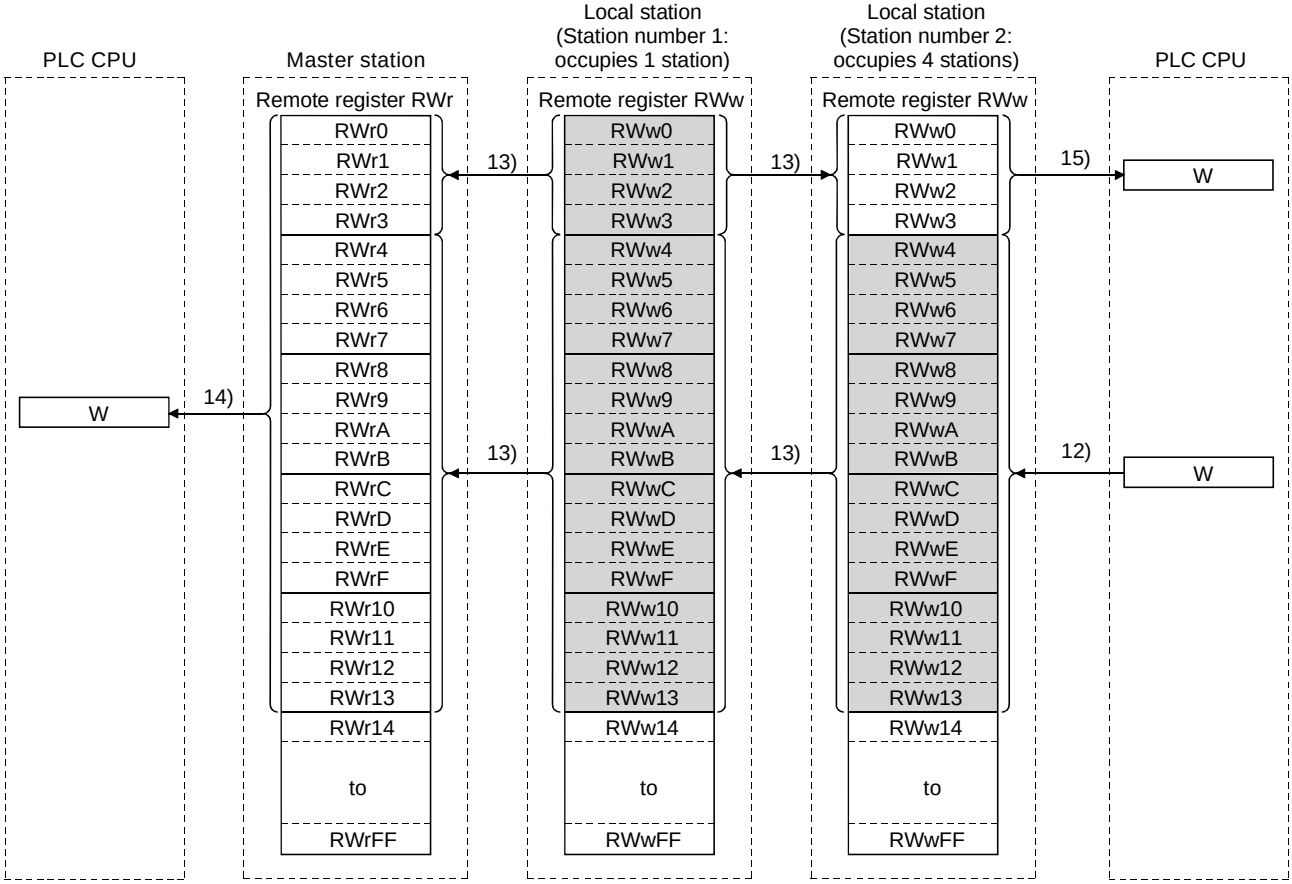
10) The data in the buffer memory "remote register RWw" is stored automatically (for each link scan) in the buffer memory "remote register RWr" of all local stations. The remote register RWr is used as word data for reading in local station systems.

11) The word data stored in the buffer memory "remote register RWr" is stored in the CPU device set with the automatic refresh parameters.



[Word data from a local station to the master and other local stations]

12) Word data set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory of the local station. However, the data is stored only in the area corresponding to its own station number.
13) The data in the "remote register RWw" buffer memory is stored automatically (for each link scan) in the "remote register RWr" of the master station and the "remote register RWw" of other local stations.
14) The word data stored in the "remote register RWr" buffer memory is stored in the CPU device set with the automatic refresh parameters.
15) The word data stored in the "remote register RWw" buffer memory is stored in the CPU device set with the automatic refresh parameters.

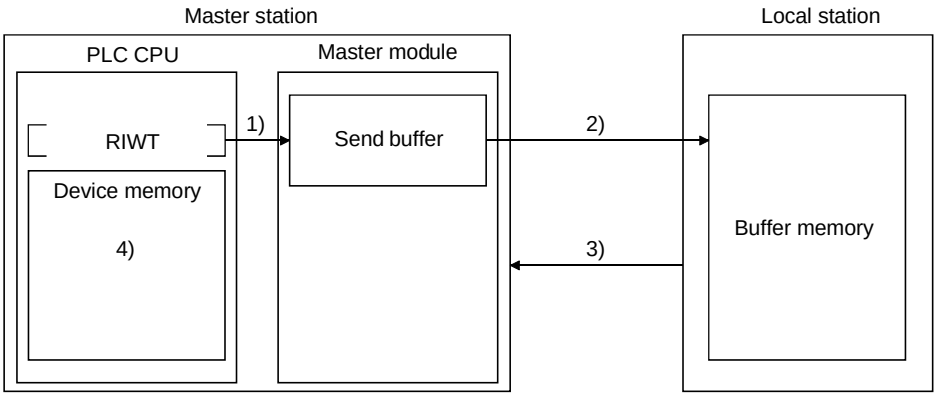


(2) Communication between the master and local stations by transient transmission

Transient transmission sends and receives data in 1 : 1 mode by specifying the opposite party at an arbitrary timing.

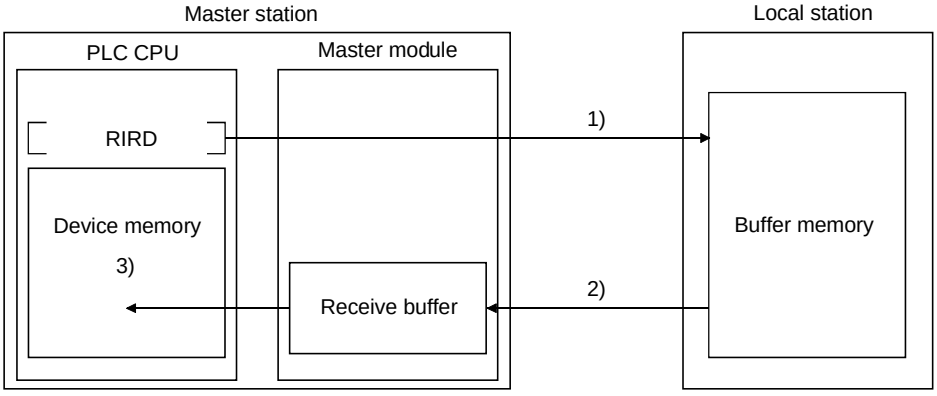
[Writing data to the buffer memory in a local station using the RIWT instruction]

1) Data to be written to the buffer memory in a local station is stored in the send buffer in the master module.
2) The data is written to the buffer memory in the local station.
3) The local station returns a writing complete response to the master station.
4) The devices specified with the RIWT instruction are turned on.




[Reading data from the buffer memory in a local station using the RIRD instruction]

1) The data in the buffer memory of the local station is accessed.
2) The data read is stored in the receive buffer of the master station.
3) The data is stored in the device memory of the PLC CPU and the devices specified with the RIRD instruction are turned on.




**POINT**

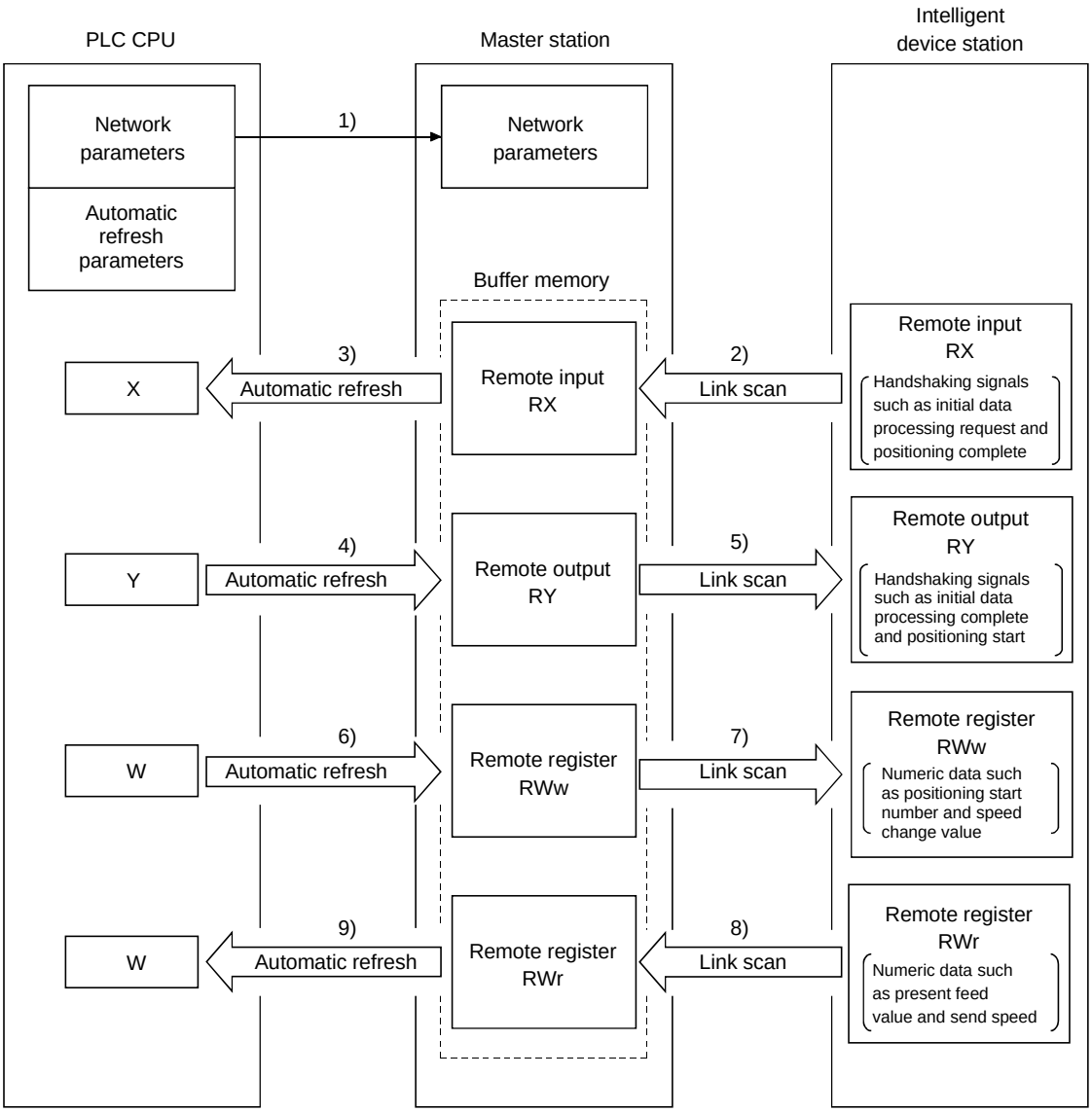
Before performing data communication using transient transmission, the sizes of the send and receive buffers must be set up in the buffer memory of the master station. For more details on setting the sizes of the send and receive buffers, see Section 6.2.

## 4.2.4 Communication with the intelligent device stations

This section explains an overview of the communication between the master and intelligent device stations.

### (1) Communication between the master station and intelligent device stations by cyclic transmission

Handshaking signals with intelligent device stations (positioning complete, positioning start. etc.) are communicated using remote input RX and remote output RX. Numeric data (positioning start number, present feed value, etc.) is communicated using remote register RWw and remote register RWr.

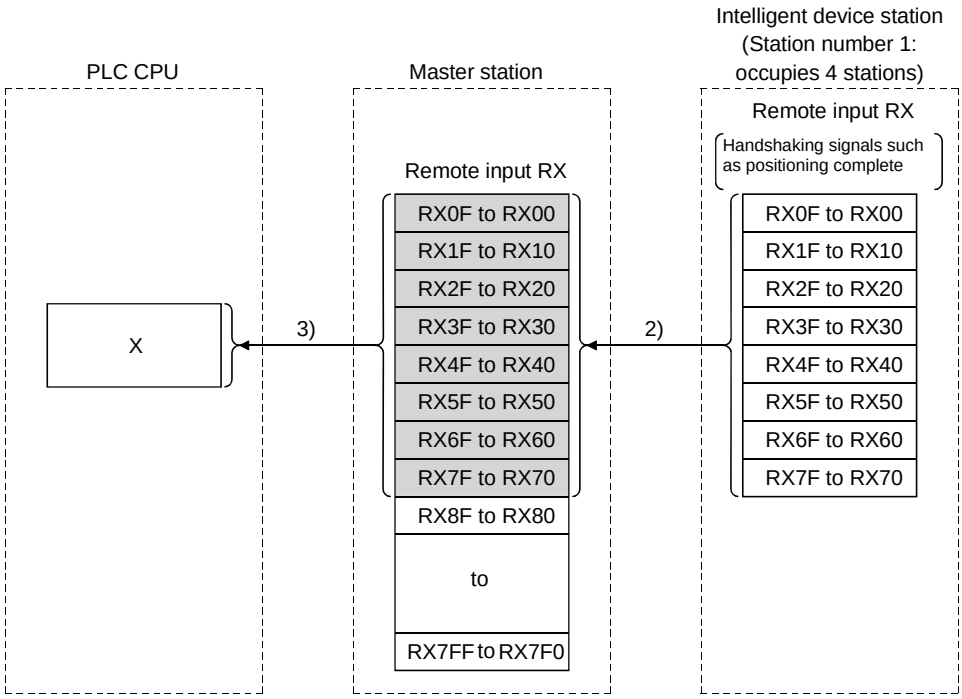


[Data link startup]

1) When the PLC system is powered on, the network parameters in the PLC CPU are transferred to the master station, and the CC-Link system automatically starts up.

[Remote input]

2) The remote input RX of an intelligent device station is stored automatically (for each link scan) in the master station's "remote input RX" buffer memory.
3) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters.

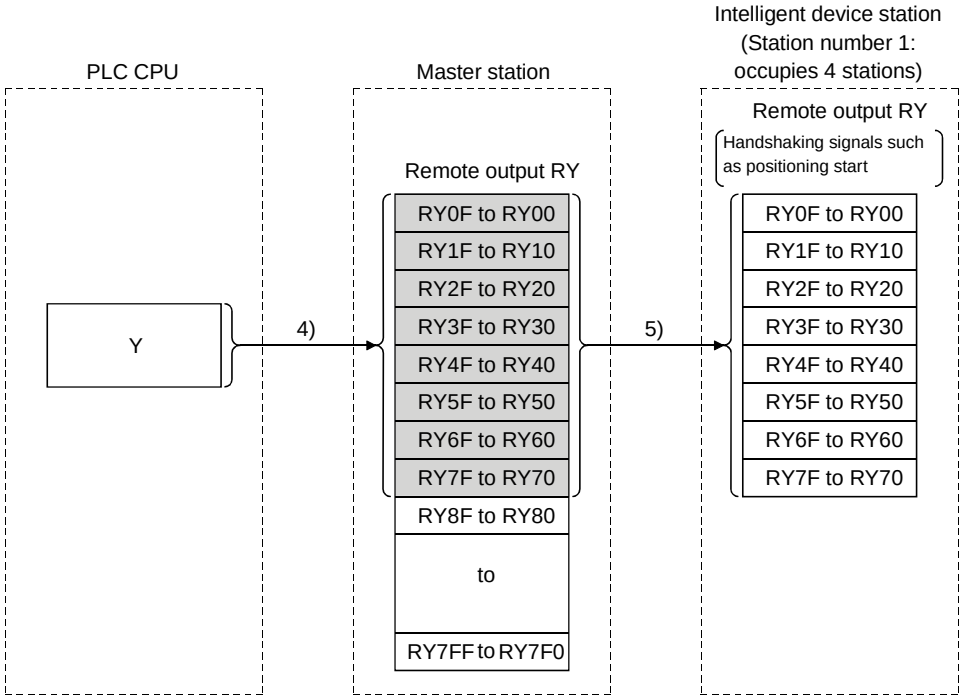



[Remote input RX when the AJ65BT-D75P2-S3 is set to station number 1]

| Signal direction: AJ65BT-D75P2-S3 → Master module | |
|---|---|
| Device No. | Signal name |
| RX00 | D75P2 ready complete |
| RX01 | Single-axis start complete |
| RX02 | Dual-axis start complete |
| RX03 | Use prohibited |
| RX04 | Single-axis BUSY |
| RX05 | Dual-axis BUSY |
| RX06 | Use prohibited |
| RX07 | Single-axis positioning complete |
| RX08 | Dual-axis positioning complete |
| to | to |

[Remote output]

4) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory.
5) Remote output RY of the intelligent device station is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.



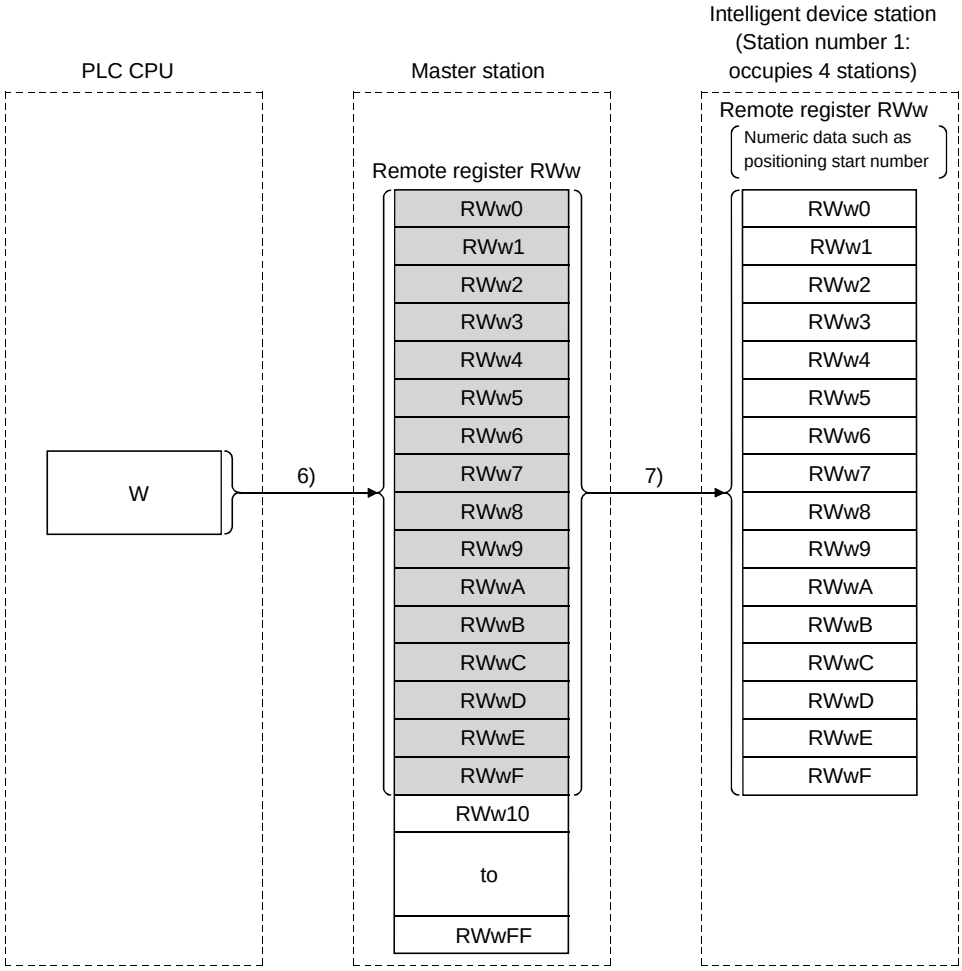

[Remote output RY when the AJ65BT- D75P2-S3 is set to station number 1]

| Signal direction: AJ65BT-D75P2-S3 → Master module | |
|---|---|
| Address | Description |
| RY01<br>to<br>RY0F | Use prohibited |
| RY10 | Single-axis positioning start |
| RY11 | Dual-axis positioning start |
| RY12 | Use prohibited |
| RY13 | Single-axis stop |
| RY14 | Dual-axis stop |
| to | to |


4 - 18

[Writing to the remote register (RWw)]

6) The transmission data of the CPU device set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory.
7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of the intelligent device station.




[Remote register RWw when the AJ65BT-D75P2-S3 is set to station number 1]

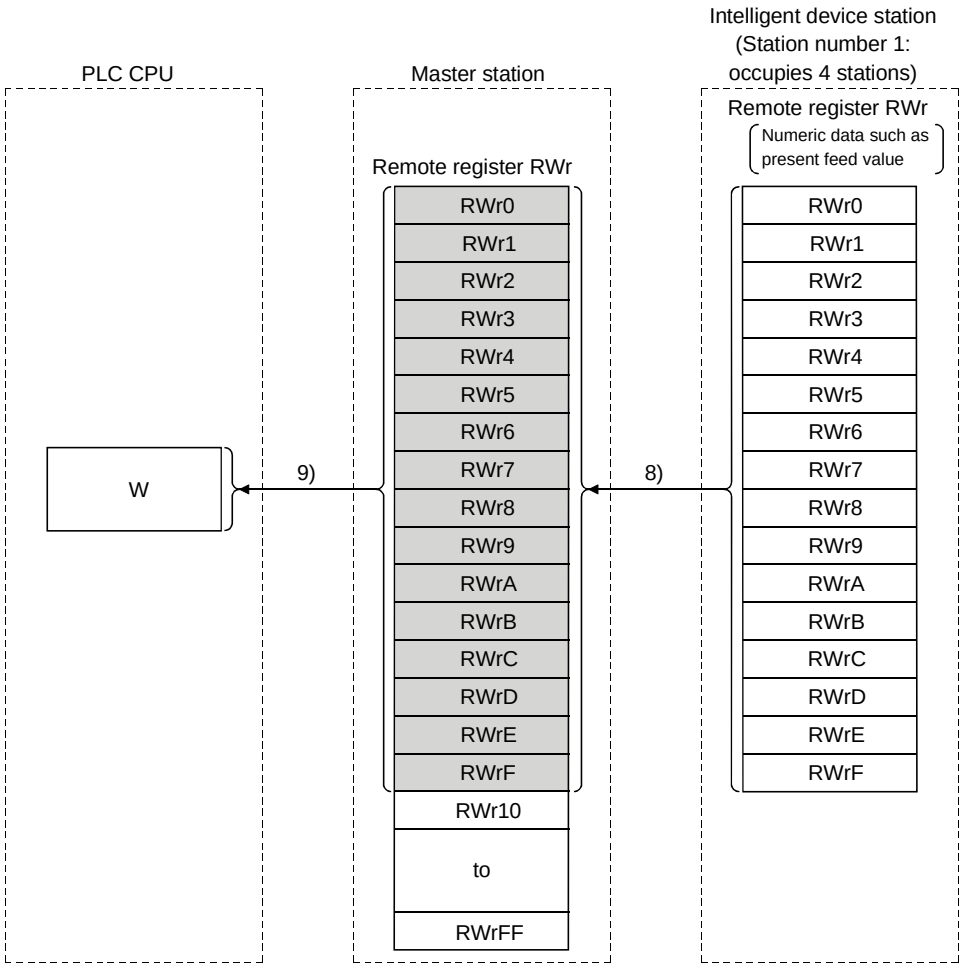
| Signal direction: Master module → AJ65BT-D75P2-S3 | |
|---|---|
| Address | Description |
| RWw0 | Single-axis positioning start number |
| RWw1 | Single-axis override |
| RWw2 | Single-axis new present value |
| RWw3 | |
| RWw4 | Single-axis new speed value |
| RWw5 | |
| RWw6 | Single-axis JOG speed |
| RWw7 | |
| to | to |

* The data content to be written to the remote registers RWw0 to RWwn is predefined for each intelligent device station.

[Reading from the remote register (RWr)]

8) The remote register RWr data of the intelligent device station is automatically stored in the "remote register Rwr" buffer memory of the master station.

9) The remote register RWr data of the intelligent device station stored in the "remote register RWr" buffer memory is stored in the CPU device set with the automatic refresh parameters.




[Remote register RWw when the AJ65BT-D75P2-S3 is set to station number 1]

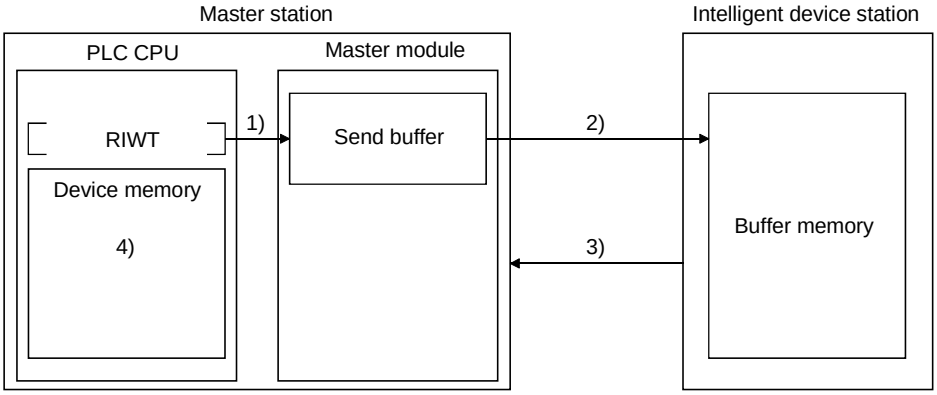
| Signal direction: AJ65BT-D75P2-S3 → Master module | |
|---|---|
| Address | Description |
| RWr0 | Single-axis present feed value |
| RWr1 | |
| RWr2 | Single-axis feed speed |
| RWr3 | |
| RWr4 | Single-axis valid M code |
| RWr5 | Single-axis error number |
| RWr6 | Single-axis warning number |
| RWr7 | Single-axis operating status |
| to | to |

(2) Communication between the master and intelligent device stations by transient transmission

Transient transmission sends and receives data in 1 : 1 mode by specifying the opposite party at an arbitrary timing.

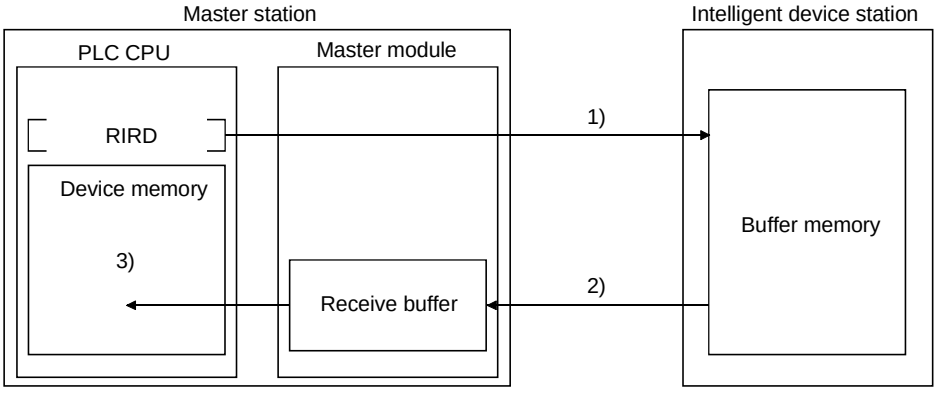
[Writing data to the buffer memory in the intelligent device station using the RIWT instruction]

1) Data to be written to the buffer memory in an intelligent device station is stored in the send buffer in the master module.
2) The data is written to the buffer memory in the intelligent device.
3) The intelligent device returns a writing complete response to the master station.
4) The devices specified with the RIWT instruction are turned on.




[Reading data from the buffer memory in the intelligent device station using the RIRD instruction]

1) The data in the buffer memory of an intelligent device station is accessed.
2) The data read is stored in the receive buffer of the master station.
3) The data is stored in the device memory of the PLC CPU and the devices specified with the RIRD instruction are turned on.




POINT

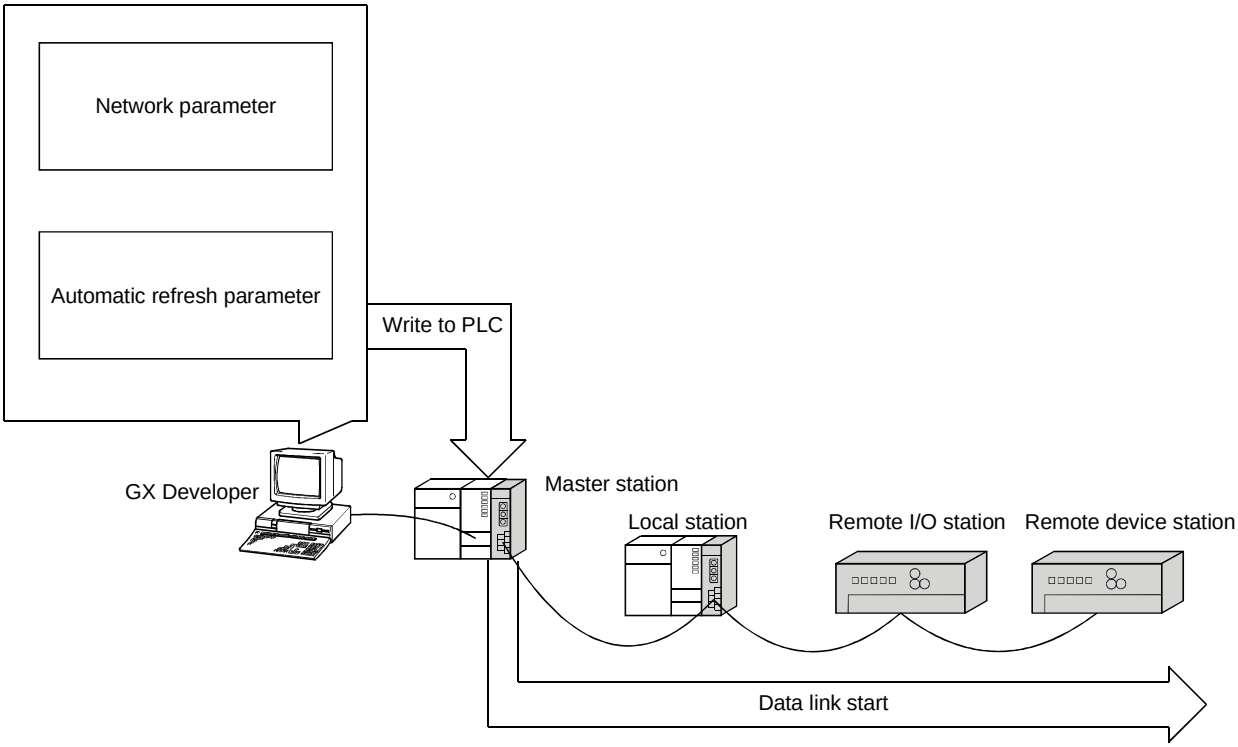
Before performing data communication using transient transmission, the sizes of the send and receive buffers must be set up in the buffer memory of the master station. For more details on setting the sizes of the send and receive buffers, see Section 6.2.

## 4.2.5 Parameter setting with GX Developer

Using GX Developer makes the setting of the network parameters and automatic refresh parameters easier.
The data link is automatically started if GX Developer is used to set the parameters.
Using GX Developer to set the parameters has the following advantages:

- It is not necessary to write a program for setting the parameters.
- It is possible to perform automatic refresh in the system.

| POINT |
| --- |
| In case a system includes both a module for which the network parameters are set by GX Developer and a module for which the network parameters are set by the dedicated instruction (RLPASET), the module for which the network parameters are set by the RLPASET instruction should not be included in the "No. of boards in module" setting of GX Developer. |




[Setting method]

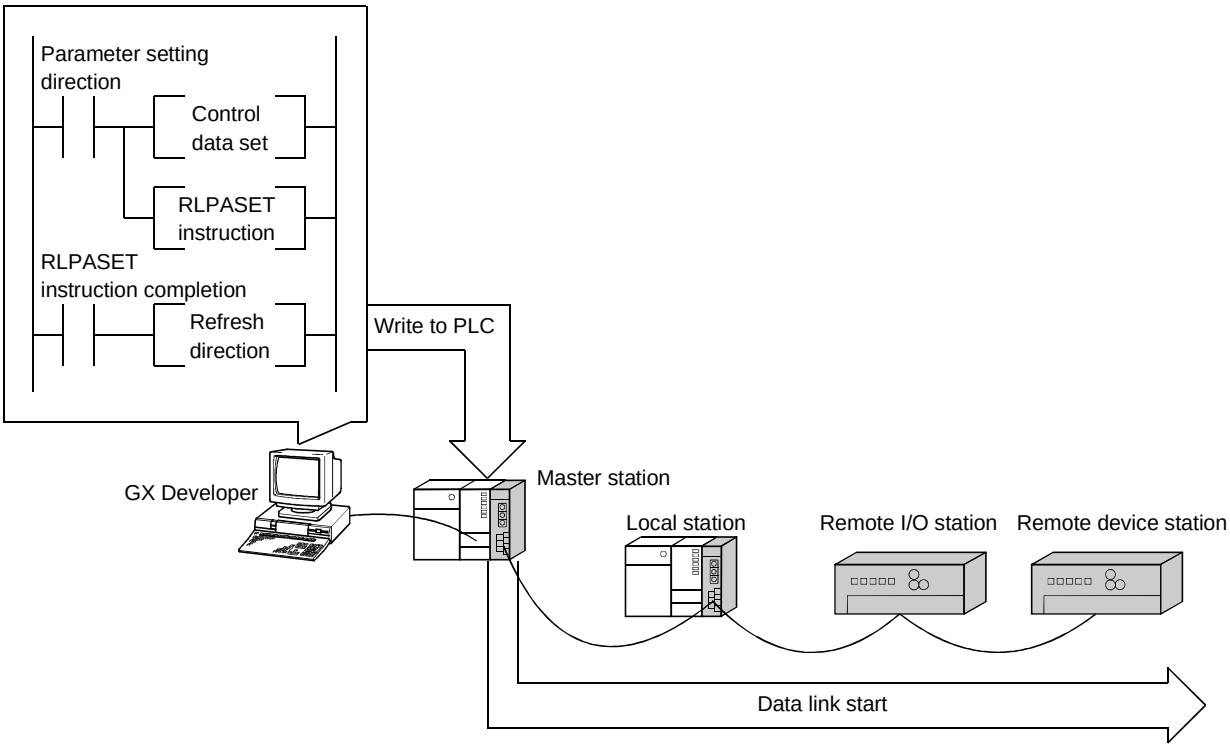
For more details on the setting, see Sections 6.3 to 6.6.

## 4.2.6 Parameter setting with dedicated instruction

It is possible to use the RLPASET instruction to set the network parameters of the master station and start the data link.
Using the RLPASET instruction to set the parameters has the following advantages:

- It is possible to mount five or more QJ61BT11N modules (see Section 2.2.1 for details about the number of CPUs that can be mounted).
- It is possible to change the network parameter settings while the PLC CPU is running.

| POINT |
| --- |
| It is recommended to use GX Developer to set the parameters when the number of QJ61BT11N mounted is 4 or less. |




### (1) Setting method

For more details on the setting, see Section 6.7.
For the RLPASET instruction, see Appendix 2.7.

### (2) Precautions when using the RLPASET instruction to set the network parameters

(a) The remote I/O net mode cannot be used.
The module operates in remote net mode.

(b) If it is necessary to change the network parameters while the PLC CPU is running and the data link is being performed, the data link should be stopped once using SB0002 (data link stop).

(c) It is necessary to set I/O assignments for modules whose network parameters are set by the RLPASET instruction.
In addition, do not use GX Developer to set the network parameters and automatic refresh parameters for modules whose network parameters are set by the RLPASET instruction.
If the RLPASET instruction is used to set network parameters for modules whose network parameters and automatic refresh parameters have been set by GX Developer, the RLPASET instruction will complete with an error and the network parameter settings performed by the RLPASET instruction become invalid.

(d) If the switch setting of an intelligent functional module for which an I/O assignment is set, has not been performed or is wrong, the RLPASET instruction completes with an error.
However, the QJ61BT11N with the smallest head I/O number seen from the PLC CPU starts CC-Link automatically.

(e) Do not use GX Developer for setting the network parameters, if the network parameters of all the modules are set by the RLPASET instruction.
Change the "No. of boards in module" setting to blank if the network parameters have been already set by GX Developer.
Moreover, in case a system includes both a module for which the network parameters are set by GX Developer and a module for which the network parameters are set by the RLPASET instruction, the module for which the network parameters are set by the RLPASET instruction should not be included in the "No. of boards in module" setting of GX Developer.

(f) Automatic refresh is not performed.
The devices should be refreshed via the FROM/TO instruction or the G device.

(g) It is not possible to set input status from a data link faulty station.
Inputs from a data link faulty station are cleared.

(h) The standby master function is not available.

(i) In order to change the parameter setting method, turn the power supply to the PLC system off and back on, or reset the PLC CPU.
The following table shows how the PLC CPU operates when changing the parameter setting method without turning the power supply to the PLC system off and back on, or resetting the PLC CPU.

| Parameter setting method (before change) | Parameter setting method (after change) | Error notification method | Continuity of data link |
|---|---|---|---|
| Parameter setting with GX Developer | Parameter setting with the RLPASET instruction | The RLPASET instruction completes with an error. | Data link continues. |
| Parameter setting with the RLPASET instruction | Parameter setting with GX Developer | LINK.PARA.ERR occurs in the PLC CPU. | Data link stops. * |

* Note that data link continues to be performed if the designation of operation at CPU down ((S1) + 5) of the RLPASET instruction is set to "Continue."

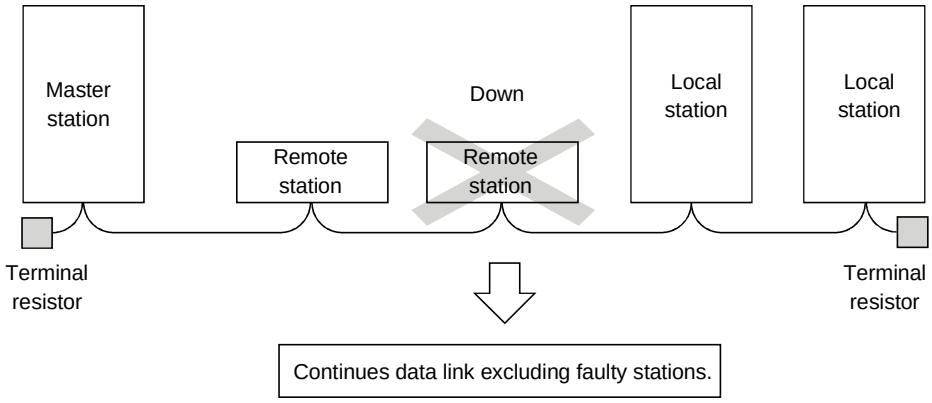
(j) When the PLC CPU is switched from RUN to STOP, RY of the master station and outputs to the remote, local, intelligent device and standby master stations are retained.

## 4.3 Functions for Improving System Reliability

This section explains the functions for improving the reliability of the CC-Link system.

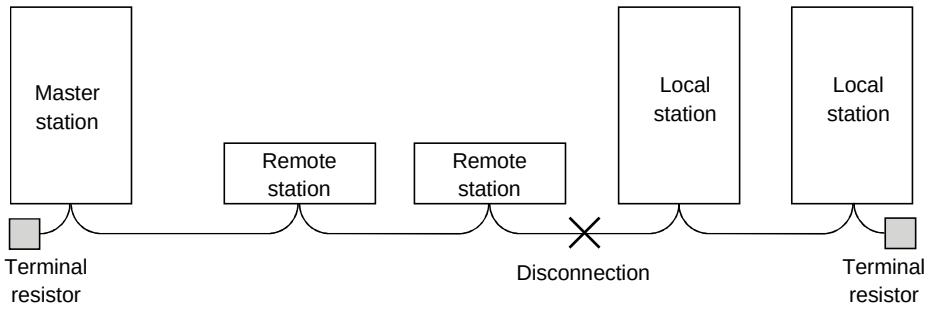
### 4.3.1 Disconnecting data link faulty stations and continuing the data link with only normal stations (Slave station cut-off function)

This function disconnects remote stations, local stations, intelligent device stations, and a standby master station that have become data link faulty due to power off, and continues the data link among normal remote stations, local stations, intelligent device stations, and standby master station (no setting is required).




**POINT**

In the event of cable disconnection, the data link cannot be performed because there is no terminal resistor ("ERR." LED lights up).



### 4.3.2 Automatically reconnecting a disconnected data link faulty station when it returns to normal (Automatic return function)

This function allows remote stations, local stations, intelligent device stations, and a standby master station that have been disconnected from the data link due to power off to automatically reconnect to the data link when they return to the normal status.

[Setting method]

Set the "Automatic reconnection station count" value in the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.5.

### 4.3.3 Continuing the data link when an error occurs in the master station PLC CPU (Data link status setting when the master station PLC CPU has an error)

This function sets the data link status when the master station PLC CPU falls into an error that stop the operation. It is possible to continue the data link among the local stations.

POINT

(1) The data link continues when the master station PLC CPU falls into an "error that stops the operation".

(2) If a standby master station is being set, the data link will not continue when the master station PLC CPU is down even when the data link status at CPU down is set to "Continue". The standby master function overrides and the data link control is transferred to the standby master station.

[Setting method]

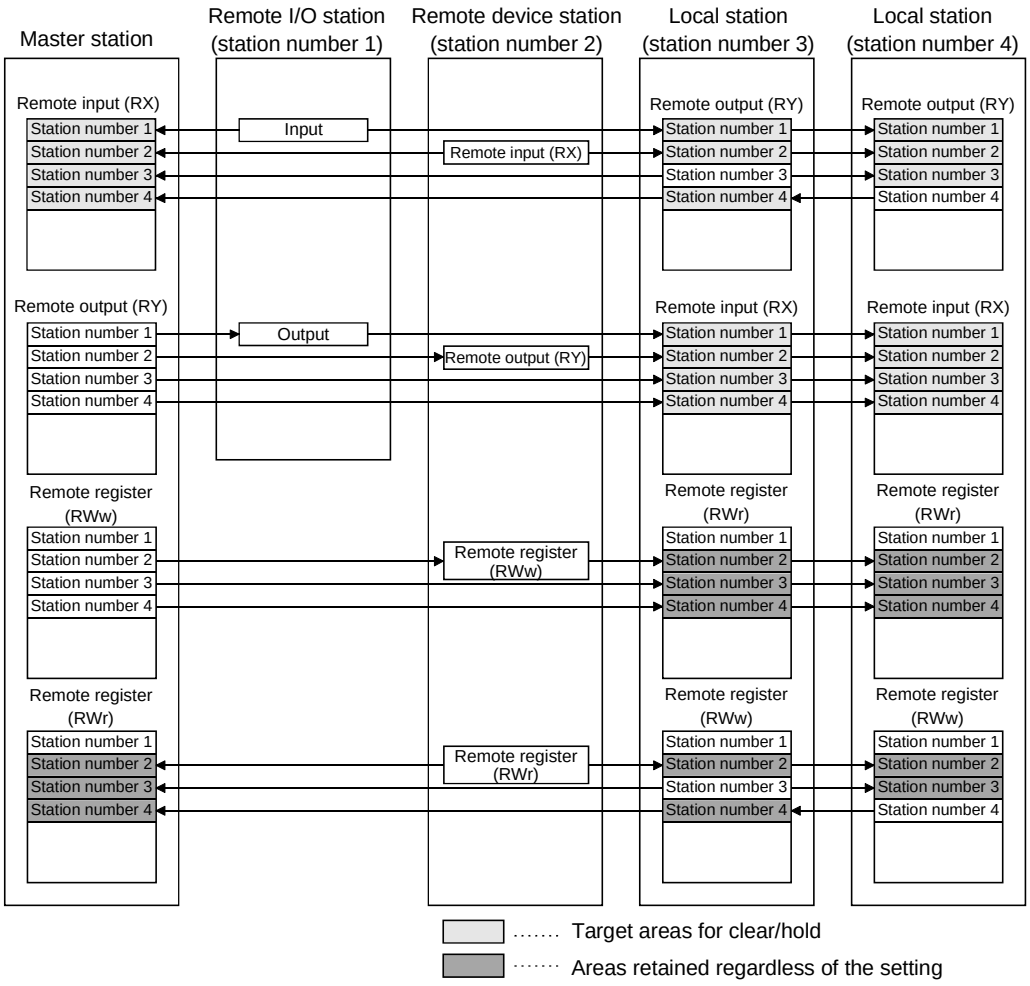
Set the above data link status with the "PLC down select" value in the network parameters using GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

## 4.3.4 Retaining the device status of a data link faulty station (Setting the status of input data from a data link faulty station)

This function sets the input (receiving) data from a data link faulty station.

### (1) Applicable input (receiving) data

The following shows the applicable buffer memory areas.




The remote input RX in the master station and the remote input RX and remote output RY in local stations either clear or retain data from faulty stations according to the setting. The remote register RWr in the master station and the remote register RWw and remote register RWr in local stations retain data from faulty stations regardless of the setting.

| POINT |
|---|
| When the data link faulty station is set as an error invalid station, input data (remote input RX) from that station is retained regardless of the setting. |

### (2) Setting method

Set the "Operational setting" value in the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

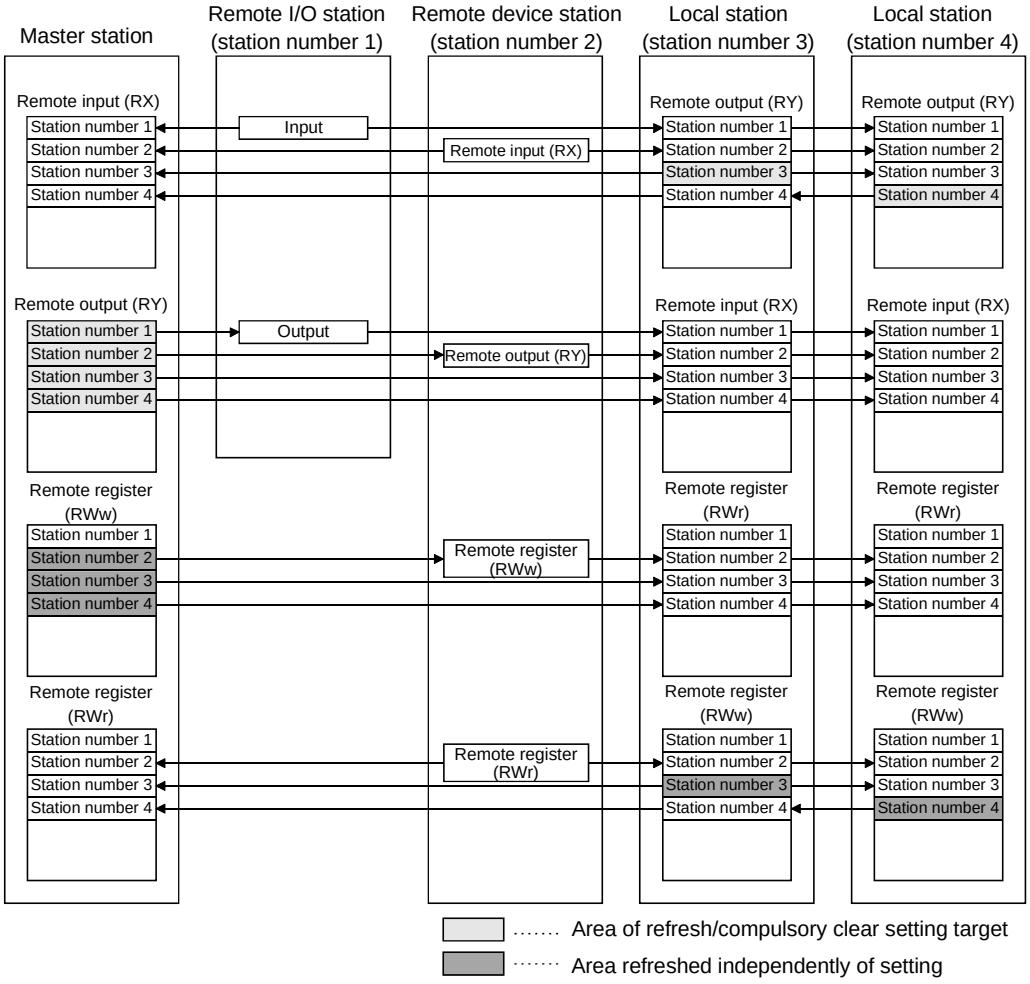
## 4.3.5 Clearing data in case of PLC CPU STOP (Slave station refresh/compulsory clear setting in case of PLC CPU STOP)

This function compulsorily clears output (send) data to slave stations when the PLC CPU comes to STOP.
Remote output RY refresh device setting in the automatic refresh parameter dialog box provides the following choices.

- When "Y" is specified, the remote output RY is cleared regardless of the parameter setting.
- When specifying any device other than "Y" (e.g. M or L), make parameter setting whether the remote output RY will be refreshed or compulsorily cleared.
  When using GX Developer for setting, use Version 8.03D or later.

### (1) Target output (send) data

The following shows the applicable buffer memory areas.




The remote output RY is refreshed or compulsorily cleared according to the setting when the PLC CPUs for the master and local stations come to STOP.
The remote input RX, remote register RWw and remote register RWr are refreshed regardless of the setting when the PLC CPUs for the master and local stations come to STOP.

POINT

(1) Specifying compulsory clear disables compulsory output to slave stations at CPU STOP using GX Developer.
(2) This setting is also valid when the TO instruction is used for RY refresh.

### (2) Setting method

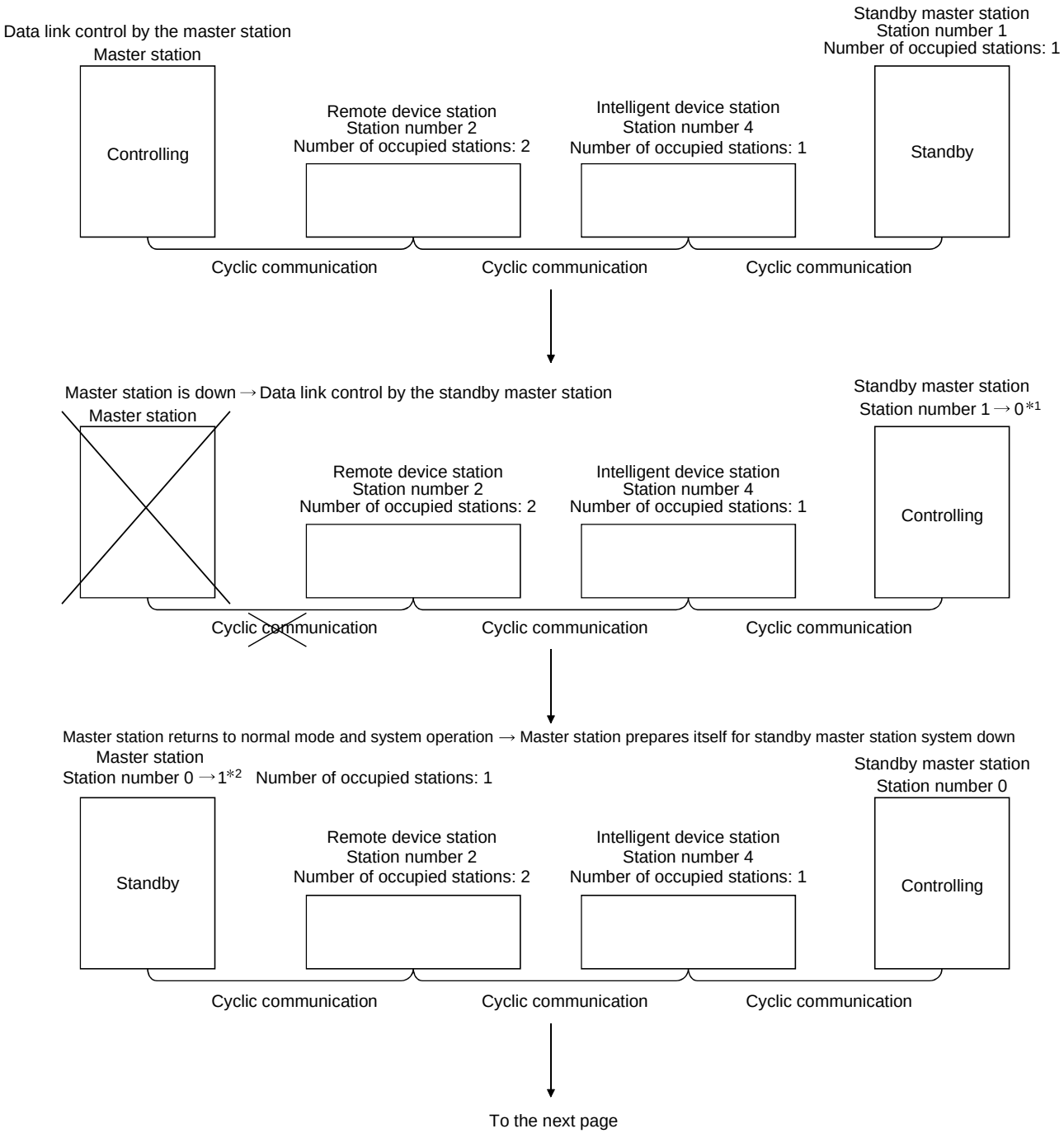
Set the "Operational setting" value in the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.


4 - 30

### 4.3.6 Continuing the data link even when the master station is faulty (Standby master function)

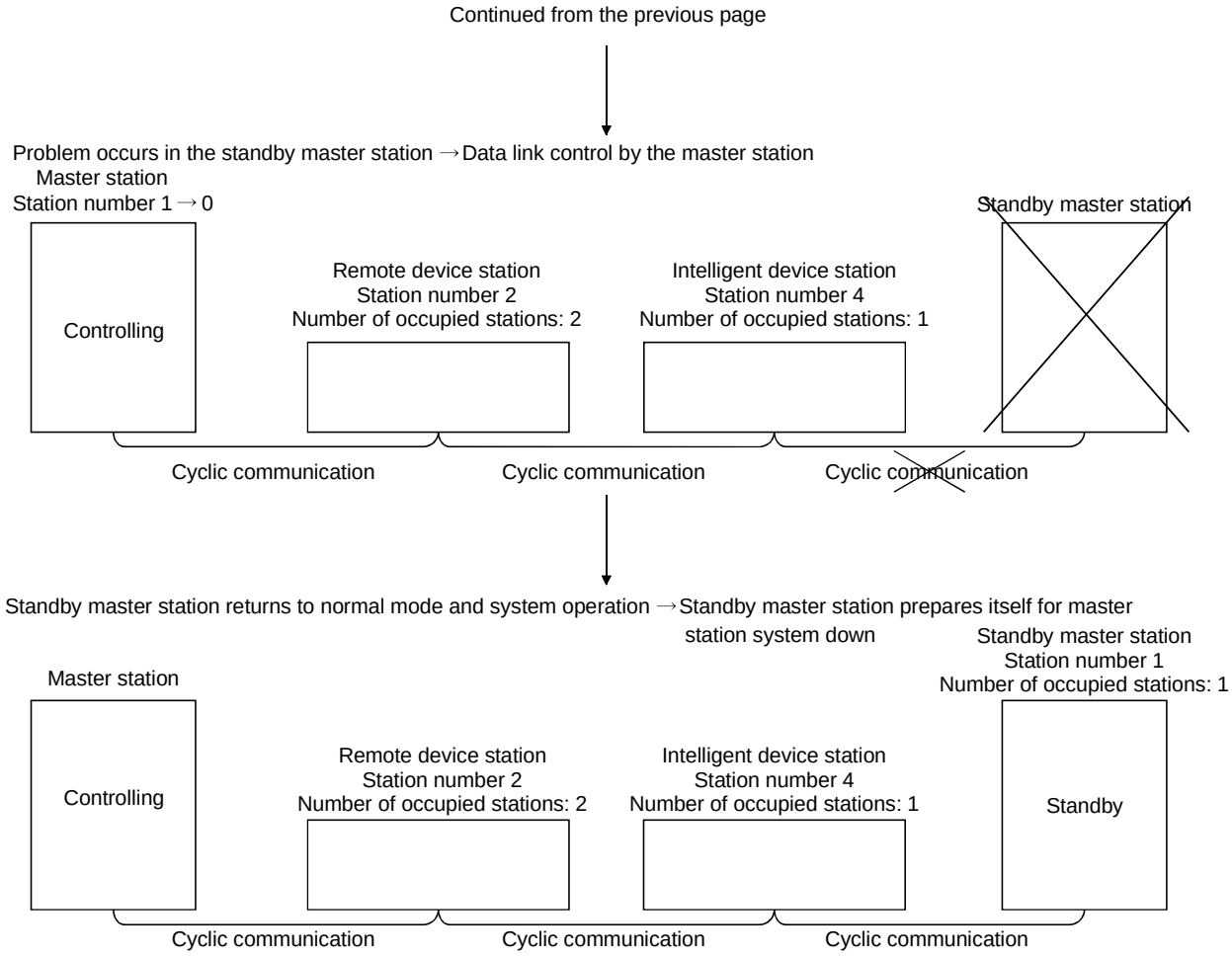
This function enables the data link to continue working by switching to a standby master station (meaning a backup station for the master station) if a system down occurs in the master station due to a malfunction in the PLC CPU or power supply. The master station can return to normal mode and to system operation as the standby master station, even during data-link control by the standby master station, thus preparing itself for a standby master station system down (master station duplex function).

Controlling: Controlling the data link of the CC-Link system
Standby: Standing by in case the station controlling the data link of the CC-Link system becomes faulty.




To the next page

∗1: When the master station becomes faulty and the data link control is transferred to the standby master station, the station number of the standby master station becomes "0".
∗2: When the master station returns to system operation as a standby master station, the station number of the master station becomes the one specified in the "Standby master station number" in the network parameters.


Continued from the previous page
Problem occurs in the standby master station →Data link control by the master station
Master station
Station number 1 → 0
Standby master station
Controlling
Remote device station
Station number 2
Number of occupied stations: 2
Intelligent device station
Station number 4
Number of occupied stations: 1
Cyclic communication
Cyclic communication
Cyclic communication
Standby master station returns to normal mode and system operation →Standby master station prepares itself for master station system down
Master station
Standby master station
Station number 1
Number of occupied stations: 1
Controlling
Remote device station
Station number 2
Number of occupied stations: 2
Intelligent device station
Station number 4
Number of occupied stations: 1
Standby
Cyclic communication
Cyclic communication
Cyclic communication

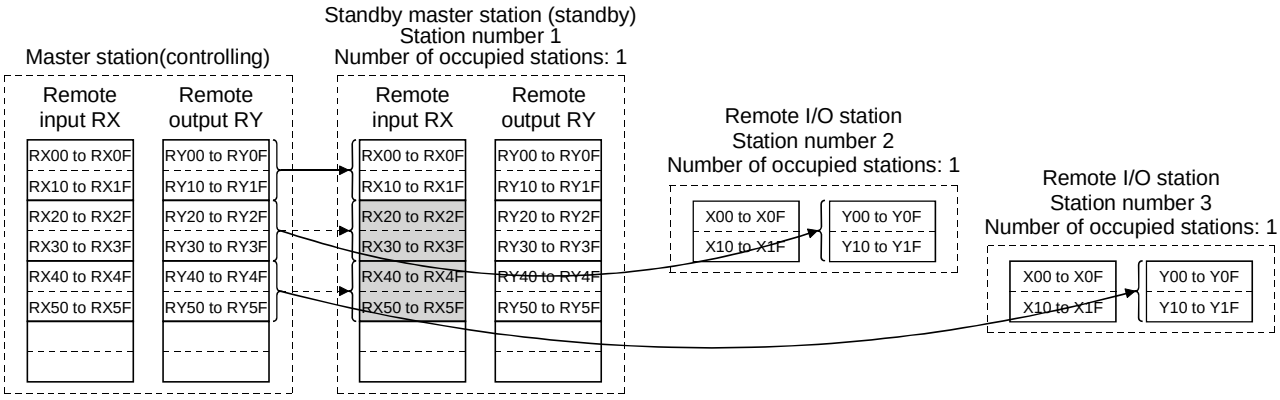

4 - 33

### (1) Overview of link data transmission when the standby master function is used

The following shows an overview of link data transmission when the standby master function is used.

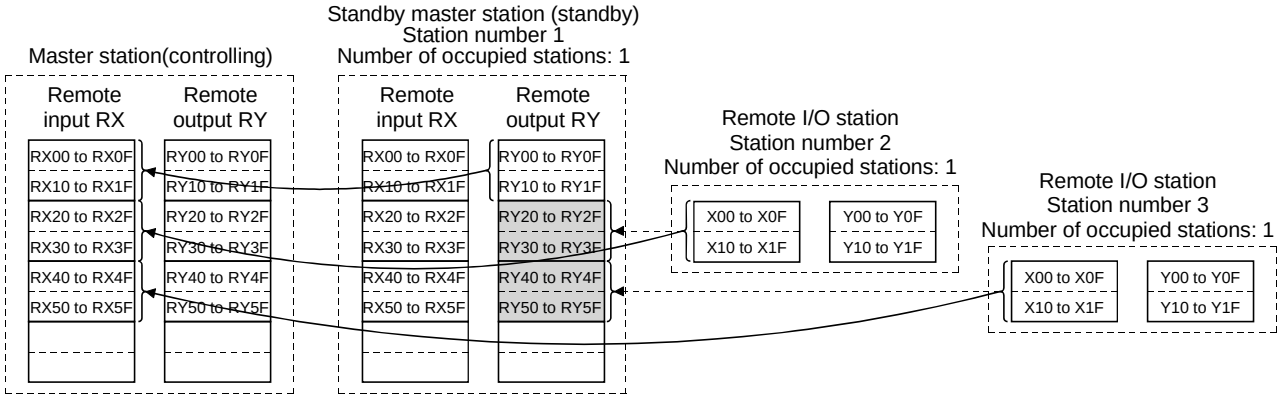
(a) When the master station controls the data link

1) Master station output




Data sent from the master station to the remote input RX and remote register RWr in the standby master station (shown by the shaded areas in the figure above) is used as output data when the master station becomes faulty; it should be saved in another device using the sequence program.
When the master station becomes faulty, the saved data is transferred to the remote output RY and remote register RWw in the standby master station using the sequence program.

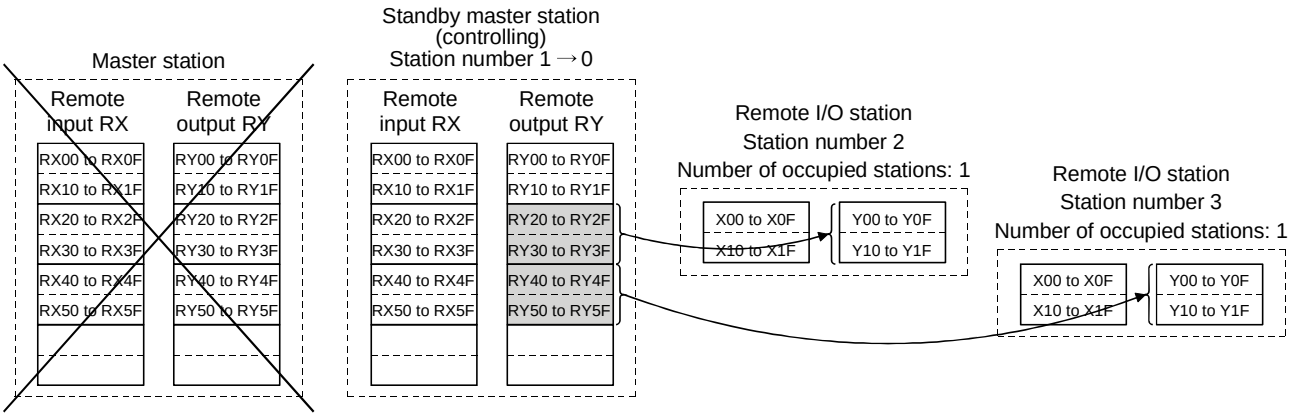
2) Master station input




Data sent to the remote output RY and remote register RWw in the standby master station is used as input data by the standby master station when local stations are operating; thus, it does not need to be saved in another device.

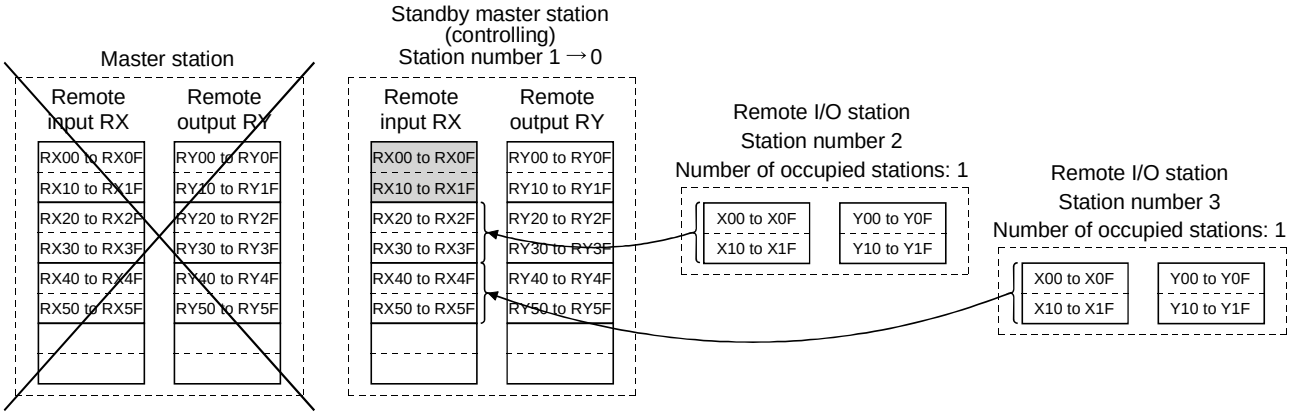
(b) When the master station is faulty and the standby master station is controlling the data link

1) Standby master station output




Data sent to the remote output RY and remote register RWw in the standby master station by the sequence program is sent to other stations as output data.

2) Standby master station input

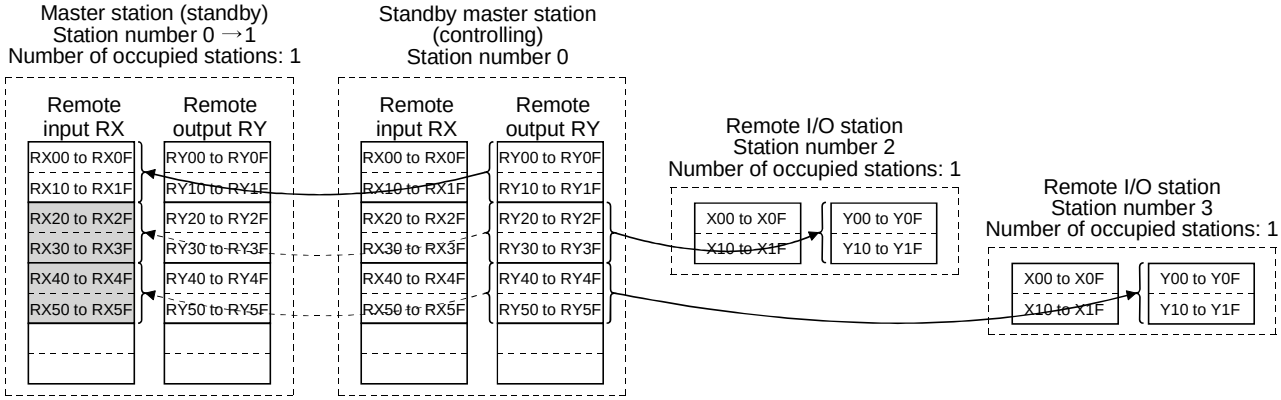



Data in the shaded areas in the standby master station is either input or retained according to the "Data link faulty station setting" in the network parameters.


4 - 35

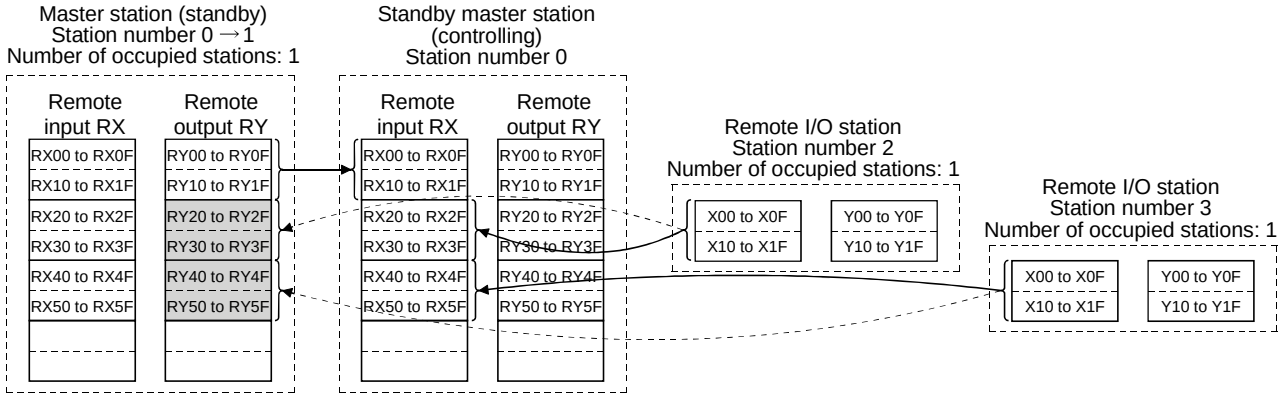
(c) When the master station has returned to system operation and the standby master station is controlling the data link

1) Standby master station output




Data sent from the standby master station to the remote input RX and remote register RWr in the standby master station (shown by the shaded areas in the figure above) is used as output data when the master station becomes faulty; it should be saved in another device using the sequence program.
When the standby master station becomes faulty, the saved data is transferred to the remote output RY and remote register RWw in the master station using the sequence program.

2) Standby master station input

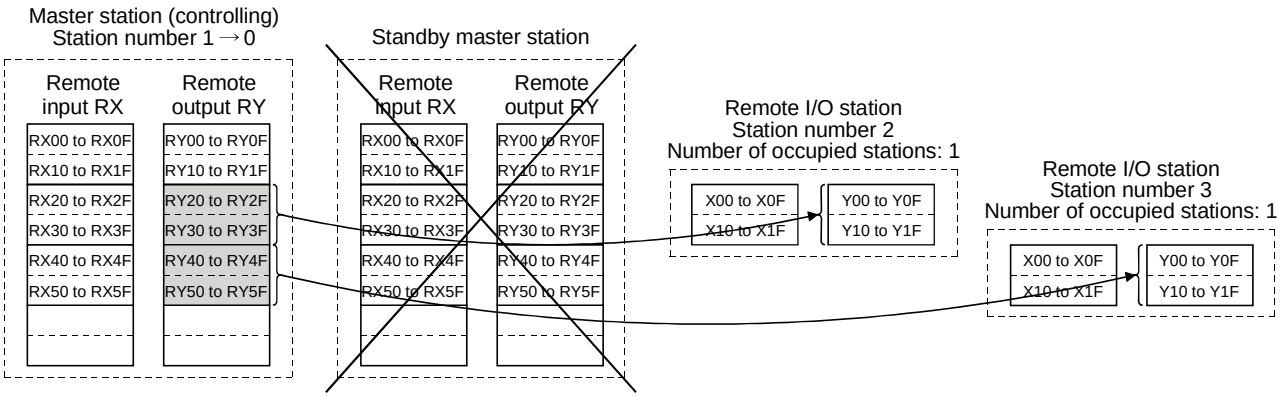



Data sent to the remote output RY and remote register RWw in the master station is being used as input data by the master station when local stations are operating; thus, it does not need to be saved in another device.


4 - 36

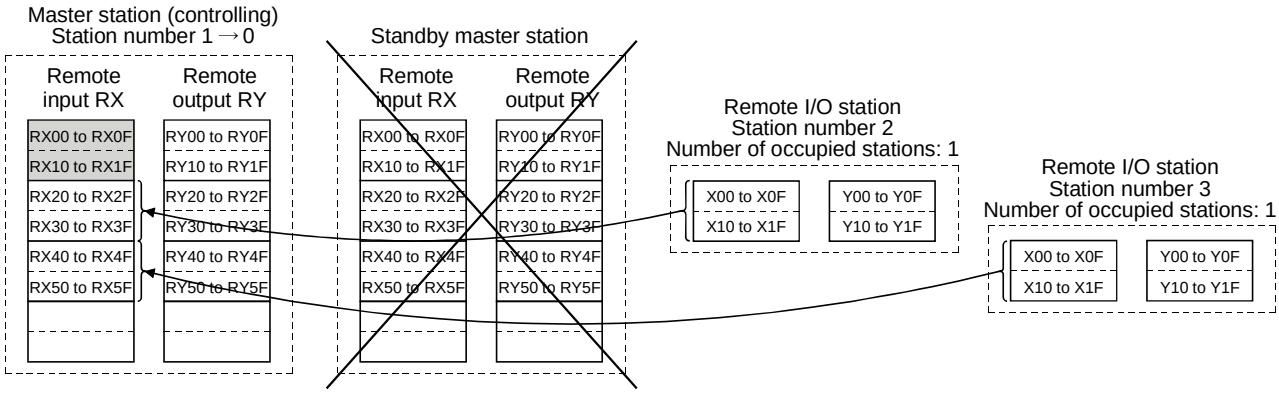
(d) When the standby master station becomes faulty and the master station controls the data link

1) Master station output




Data sent to the remote output RY and remote register RWw in the master station by the sequence program is sent to other stations as output data.

2) Master station input




Data in the shaded areas in the master station is either input or retained according to the "Operational settings" in the network parameters.


4 - 37

### (2) Setting method

Perform the setting using the GX Developer.

(a) Setting the master station

First, set "Type" in the network parameters.

Master station that was down returns to system operation: Master station (Duplex function)

Master station that was down does not return to system operation: Master station

Next, set the "Standby master station No." of the network parameter.

Setting range: 1 to 64 (blank means no specification for standby master station)

Default : blank (no specification for standby master station)

| | 1 |
|---|---|
| Start I/O No | |
| Operational setting | Operational settings |
| Type | Master station(Duplex function) |
| Master station data link type | PLC parameter auto start |
| Mode | Remote net(Ver.1 mode) |
| All connect count | 3 |
| Remote input(RX) | X1000 |
| Remote output(RY) | Y1000 |
| Remote register(RWr) | W0 |
| Remote register(RWw) | W100 |
| Ver.2 Remote input(RX) | |
| Ver.2 Remote output(RY) | |
| Ver.2 Remote register(RWr) | |
| Ver.2 Remote register(RWw) | |
| Special relay(SB) | SB0 |
| Special register(SW) | SW0 |
| Retry count | 3 |
| Automatic reconnection station count | 1 |
| Stand by master station No. | 1 |
| PLC down select | Stop |
| Scan mode setting | Asynchronous |
| Delay infomation setting | 0 |
| Station information setting | Station information |
| Remote device station initial setting | Initial settings |
| Interrupt setting | Interrupt settings |

(b) Setting the standby master station

Set "Type" in the network parameters to "Standby master station".

Set the mode according to the mode setting of the master station.

| | 1 |
|---|---|
| Start I/O No | |
| Operational setting | Operational settings |
| Type | Stand by master station |
| Master station data link type | |
| Mode | Remote net(Ver.1 mode) |
| All connect count | |
| Remote input(RX) | X1000 |
| Remote output(RY) | Y1000 |
| Remote register(RWr) | W0 |
| Remote register(RWw) | W100 |
| Ver.2 Remote input(RX) | |
| Ver.2 Remote output(RY) | |
| Ver.2 Remote register(RWr) | |
| Ver.2 Remote register(RWw) | |
| Special relay(SB) | SB0 |
| Special register(SW) | SW0 |
| Retry count | |
| Automatic reconnection station count | |
| Stand by master station No. | |
| PLC down select | |
| Scan mode setting | |
| Delay infomation setting | |
| Station information setting | |
| Remote device station initial setting | |
| Interrupt setting | Interrupt settings |

### (3) Precautions on using the standby master function

(a) Only one standby master station exists in a single data link system.

(b) The total number of stations is 64, including the standby master station. The number of stations that can be occupied by the standby master station is one or four.

(c) If an error is detected at the master station in the initial status (before parameter communication starts), switching to the standby master station will not be executed.

(d) When the master station becomes faulty, the data link control will automatically be transferred to the standby master station, but the refresh instruction of the cyclic data will not be issued. Specify the cyclic data refresh using the sequence program. Once specified, the information prior to the error detection at the master station will be output to each station.

(e) When the data link is being controlled by the standby master station, the master station's parameters cannot be updated.

(f) An error (error code: B39A) occurs at the standby master station if there is a difference between the station number setting of the station number setting switches of the standby master station and the station number setting of the network parameter "standby master station number" of the master station. If an error has occurred, change the parameter setting of the master station or the station number setting switch setting of the standby master station, and then reset the PLC CPU of the standby master station.

(g) If the terminal block of the master station is removed and then replaced in its original position without turning the power off when the master station is controlling the data link, both the master and standby master stations operate as master stations. An error occurs since the data link control has been transferred to the standby master station ("ERR." LED lights up).

(h) When the master station becomes faulty and the data link control is transferred to the standby master station, the "ERR." LED of the standby master station flashes. (This is because the station number of the standby master station will change from the one set with a parameter to "0" and the standby station becomes nonexistent. Data link itself is performed normally.) To avoid this situation, set the standby master station to be an error invalid station.

(i) The number and range of devices that will be saved by the sequence program among the data sent from (the station operating as) the master station to (the station operating as) the standby station may differ according to the system used.

### (4) Link special relays/registers (SB and SW) relating to the standby master function

The following explains the link special relays and registers relating to the standby master function. These are stored in the buffer memory.
When the standby master station is controlling the data link, its applicability is basically identical to that of the master station. When the standby master station is operating as a local station, its applicability is identical to that of the local station.

(a) Link special relays (SB)

The link special relays (SB) relating to the standby master function are as follows : The figures in parentheses in the number column indicate buffer memory addresses and bit locations.

Example: When the buffer memory address is 5E0H and the bit location is 0: (5E0H, b0)

Table 4.5 List of link special relays relating to the standby master function (1/2)

| Number | Name | Description | Applicability (○: Applicable, ×: Not applicable) | | |
|---|---|---|---|---|---|
| | | | Master station | Local station | Offline |
| SB0001 (5E0H, b1) | Refresh instruction at standby master switching | Gives refresh instruction for cyclic data after the data link control is transferred to the standby master station.<br>0: No instruction<br>1: Instructed | ○ | × | × |
| SB000C (5E0H, b12) | Forced master switching | Forcefully transfers the data link control from the standby master station that controls the data link to the master station that stands by in case the standby master station becomes faulty.<br>0: No request<br>1: Requested | ○ | × | × |
| SB0042 (5E4H, b2) | Refresh instruction acknowledgement status at standby master switching | Indicates whether the refresh instruction at standby master switching has been acknowledged or not.<br>0: Not acknowledged<br>1: Instruction acknowledged | × | ○ | × |
| SB0043 (5E4H, b3) | Refresh instruction complete status at standby master switching | Indicates whether the refresh instruction at standby master switching is complete or not.<br>0: Not complete<br>1: Switching complete | × | ○ | × |
| SB0046 (5E4H, b6) | Forced master switching executable status | Indicates whether the forced master switching (SB000C) signal can be executed or not.<br>OFF: Cannot be executed.<br>ON: Can be executed. | ○ | × | × |
| SB005A (5E5H, b10) | Master switching request acknowledgement | Indicates the acknowledgement status of the standby master station when it has received a master switching request from the line.<br>OFF: Not acknowledged<br>ON: Request acknowledged | ○ | ○ | × |
| SB005B (5E5H, b11) | Master switching request complete | Indicates whether or not the switch from the standby master station to the master station is complete.<br>OFF: Not complete<br>ON: Complete | ○ | × | × |
| SB005C (5E4H, b12) | Forced master switching request acknowledgement | Indicates whether a forced master switching request has been acknowledged or not.<br>0: Not acknowledged<br>1: Instruction acknowledged | ○ | × | × |

Table 4.5 List of link special relays relating to the standby master function (2/2)

| Number | Name | Description | Applicability (○: Applicable, ×: Not applicable) | | |
|---|---|---|---|---|---|
| | | | Master station | Local station | Offline |
| SB005D ($5E5_H$, b13) | Forced master switching request complete | Indicates whether a forced master switching request acknowledgement is complete or not.<br>0: Not complete<br>1: Switching complete | ○ | × | × |
| SB0062 ($5E6_H$, b2) | Host standby master station setting information | Indicates whether or not the standby master station setting exists for the host.<br>0: No setting<br>1: Setting exists | ○ | ○ | ○ |
| SB0070 ($5E7_H$, b0) | Master station information | Shows the data link status.<br>0: Data link control by the master station<br>1: Data link control by the standby master station | ○ | ○ | × |
| SB0071 ($5E7_H$, b1) | Standby master station information | Indicates whether or not there is a standby master station.<br>0: No standby master station<br>1: Standby master station exists | ○ | ○ | × |
| SB0079 ($5E7_H$, b9) | Master station return specification information | Indicates whether the "Type" setting in the network parameters is set to "Master station" or "Master station (Duplex function)."<br>OFF: Master station<br>ON: Master station (Duplex function) | ○ | × | × |
| SB007B ($5E7_H$, b11) | Host master/standby master operation status | Indicates whether the host operates as the master or standby master station.<br>OFF: Operates as a master station (controlling data link)<br>ON: Operates as a standby master station (standby) | ○ | ○ | × |

(b) Link special registers (SW)

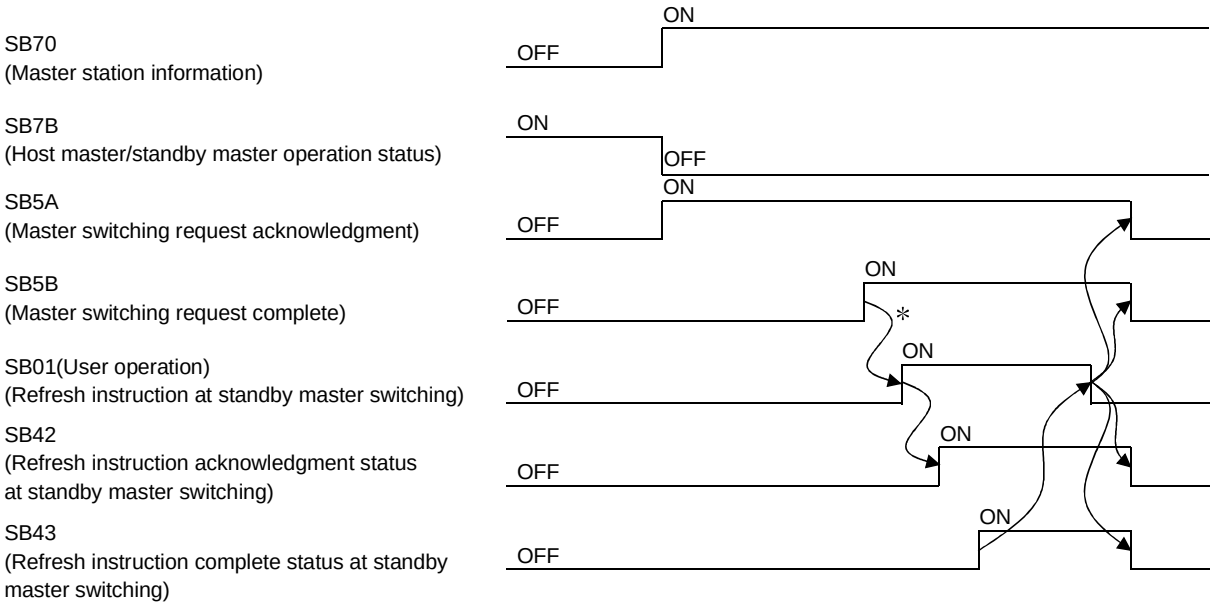
The following describes the link special registers (SW) relating to the standby master function. The figures in parentheses in the number column indicate buffer memory addresses.

Table 4.6 List of link special registers relating to the standby master function

| Number | Name | Description | Applicability (○: Applicable, ×: Not applicable) | | |
|---|---|---|---|---|---|
| | | | Master station | Local station | Offline |
| SW0043 ($643_H$) | Refresh instruction at standby master switching result | Indicates the execution result of refresh instruction at standby master switching.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | × | × |
| SW005D ($65D_H$) | Forced master switching instruction result | Stores the execution result of the forced master switching instruction with SB000C.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | × | × |
| SW0073 ($673_H$) | Standby master station number | Stores the station number of the standby master station.<br>1 to 64 (station) | ○ | ○ | × |

### (5) On/off timings of link special relays (SB) relating to the standby master function

The following shows the on/off timings of the link special relays (SB) relating to the standby master function.



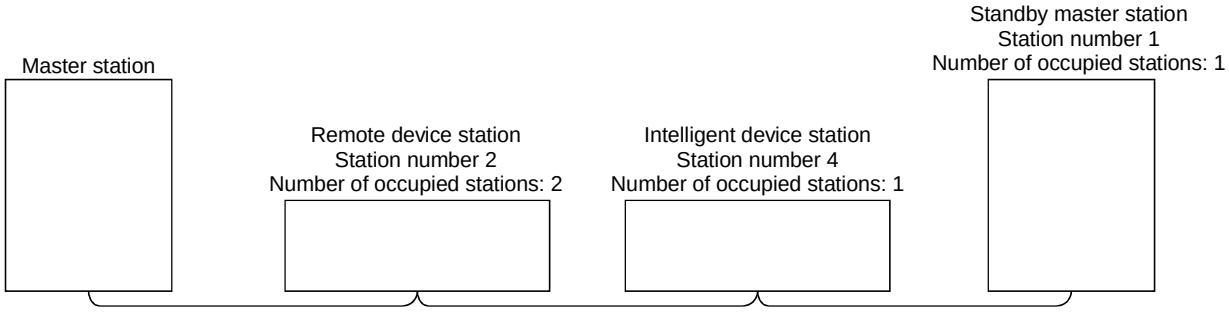

* When SB5B is turned on, the program switches RX to RY and RWr to RWw.
  In addition, the program turns SB01 on.


4 - 42

### (6) Program example when the standby master function (master station duplex function) is used

A program example is created under the following conditions when the standby master function (master station duplex function) is used.

(a) System configuration




(b) Parameter settings of the master station

| | 1 |
|---|---|
| Start I/O No | |
| Operational setting | Operational settings |
| Type | Master station(Duplex function) |
| Master station data link type | PLC parameter auto start |
| Mode | Remote net(Ver.1 mode) |
| All connect count | 3 |
| Remote input(RX) | X1000 |
| Remote output(RY) | Y1000 |
| Remote register(RWr) | W0 |
| Remote register(RWw) | W100 |
| Ver.2 Remote input(RX) | |
| Ver.2 Remote output(RY) | |
| Ver.2 Remote register(RWr) | |
| Ver.2 Remote register(RWw) | |
| Special relay(SB) | SB0 |
| Special register(SW) | SW0 |
| Retry count | 3 |
| Automatic reconnection station count | 1 |
| Stand by master station No. | 1 |
| PLC down select | Stop |
| Scan mode setting | Asynchronous |
| Delay infomation setting | 0 |
| Station information setting | Station information |
| Remote device station initial setting | Initial settings |
| Interrupt setting | Interrupt settings |

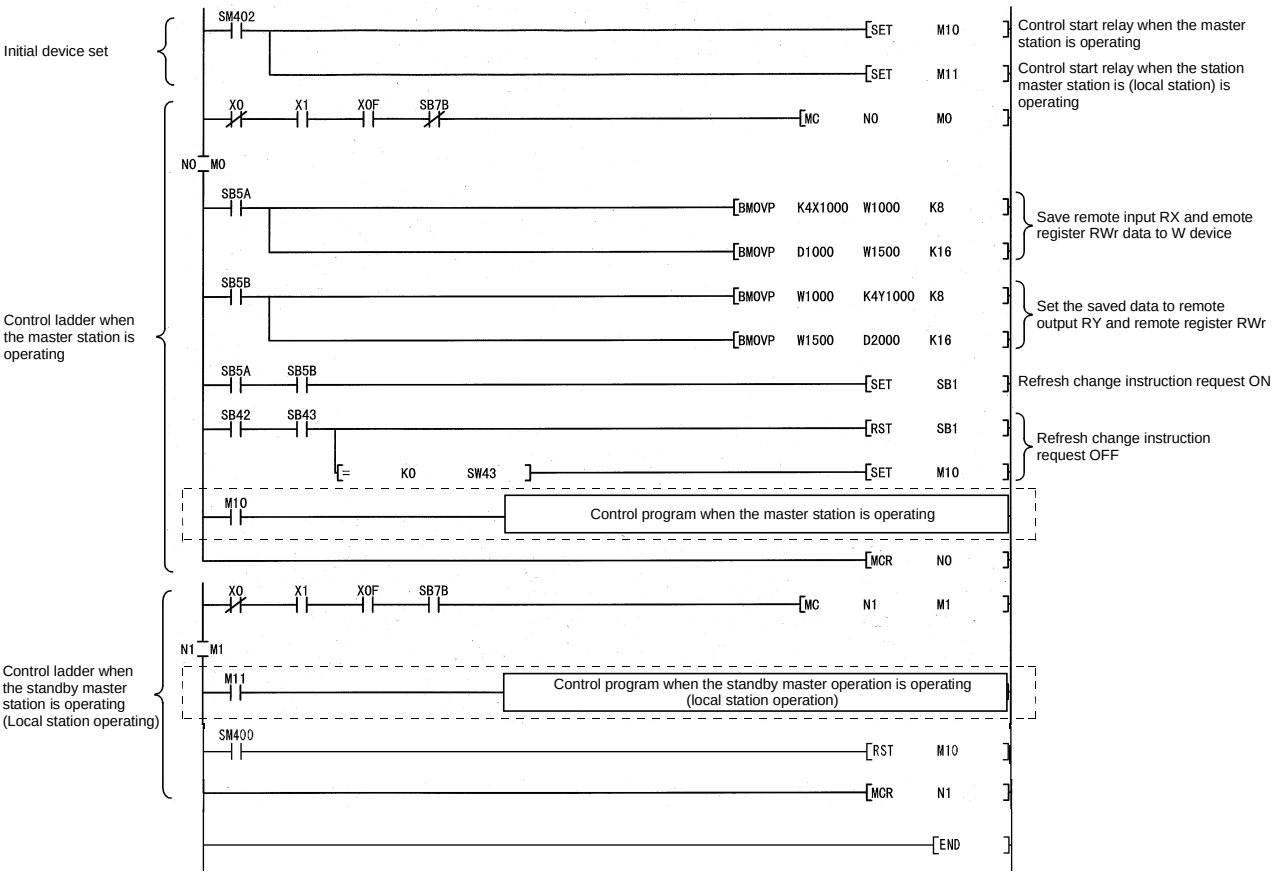
(c) Parameter settings of the standby master station

| | 1 |
|---|---|
| Start I/O No | |
| Operational setting | Operational settings |
| Type | Stand by master station |
| Master station data link type | |
| Mode | Remote net(Ver.1 mode) |
| All connect count | |
| Remote input(RX) | X1000 |
| Remote output(RY) | Y1000 |
| Remote register(RWr) | W0 |
| Remote register(RWw) | W100 |
| Ver.2 Remote input(RX) | |
| Ver.2 Remote output(RY) | |
| Ver.2 Remote register(RWr) | |
| Ver.2 Remote register(RWw) | |
| Special relay(SB) | SB0 |
| Special register(SW) | SW0 |
| Retry count | |
| Automatic reconnection station count | |
| Stand by master station No. | |
| PLC down select | |
| Scan mode setting | |
| Delay infomation setting | |
| Station information setting | |
| Remote device station initial setting | |
| Interrupt setting | Interrupt settings |


4 - 43

(d) Program example when standby master function (master station duplex function) is used

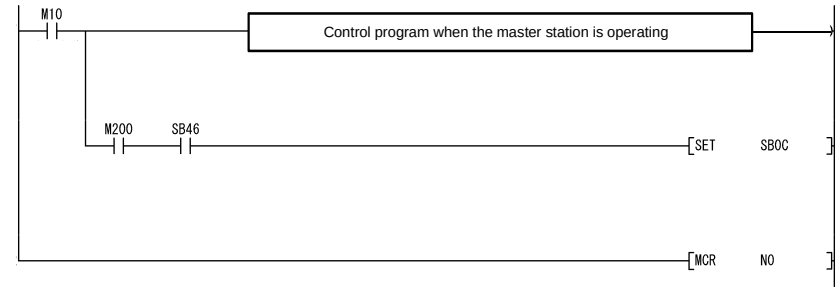
- Control start relay used when master station is operating ..... M10
- Control start relay used when standby master station is operating ..... M11

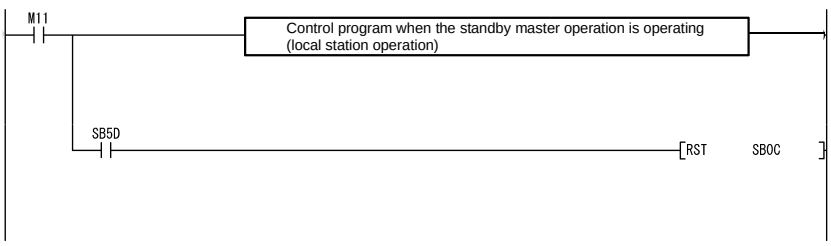

Initial device set
SM402
SET M10
Control start relay when the master station is operating
SET M11
Control start relay when the station master station is (local station) is operating
X0 X1 X0F SB7B
MC N0 M0
N0 M0
Control ladder when the master station is operating
SB5A
BMOVP K4X1000 W1000 K8
BMOVP D1000 W1500 K16
Save remote input RX and emote register RWr data to W device
SB5B
BMOVP W1000 K4Y1000 K8
BMOVP W1500 D2000 K16
Set the saved data to remote output RY and remote register RWr
SB5A SB5B
SET SB1
Refresh change instruction request ON
SB42 SB43
RST SB1
= K0 SW43
SET M10
Refresh change instruction request OFF
M10
Control program when the master station is operating
MCR N0
X0 X1 X0F SB7B
MC N1 M1
N1 M1
Control ladder when the standby master station is operating (Local station operating)
M11
Control program when the standby master operation is operating (local station operation)
SM400
RST M10
MCR N1
END

(e) When forcibly switching the data link control right from the standby master station to the master station

The areas enclosed by the broken and dotted lines in the program example shown in (d) must be modified as shown below.

- Forced master switching request ..... M200



## 4.4 Handy Functions

This section explains some handy functions of the QJ61BT11N.

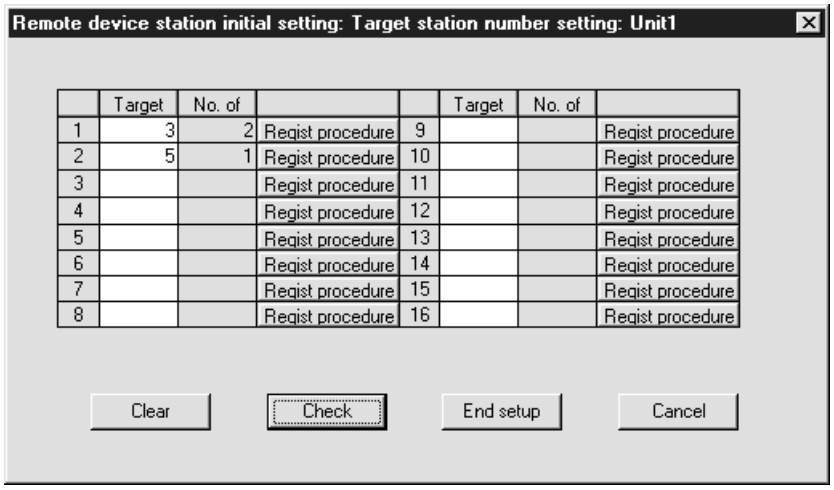
### 4.4.1 Simplifying the initialization procedure registration of remote device stations (Remote device station initialization procedure registration function)

The initial settings of remote device stations, which in previous models were done using the sequence program, can now be performed using the GX Developer for registration to the PLC CPU.
Settings such as "A-D conversion enable/disable" and "Averaging processing specification" can be performed easily with the AJ65BT-64AD.
For an example of an initialization procedure using the GX Developer, see Sections 10.1.3, 10.2.3 and 10.3.3.

#### (1) Initialization procedure setting method

The initial settings are performed using the "Remote device station initial setting" in the network parameters. A maximum of 16 stations can be set. When 17 or more remote device stations are connected, perform the initial settings for the 17th and subsequent stations using the sequence program.

(a) In "Target", set the station number of a module for which the initial settings are to be performed.
Setting range: 1 to 64



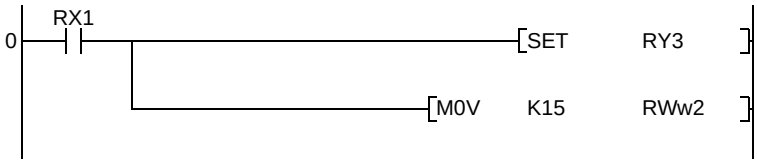

(b) Set the initialization procedure in "Regist procedure".

1) Input format
Set the data input format for "Write data" in details of execution.
Setting range: DEC.
HEX.
Default: DEC.


4 - 45

2) Execute Flag
Set whether or not to execute the specified initialization procedure.
Setting range: Execute
Only set (use as a memo when the execution conditions are the same as when the execution flag is set as "Execute", but the content of execution is different.)
Default: Execute

3) Operational condition
Specify whether new settings or the previous settings are used for the initialization conditions.
Setting range: Set new
Same as prev. set
Default: Set new
When "Same as prev. set" is selected, the processing is performed as follows:
Example)




4) Executional condition settings "Condition Device"
Set the device to be used for the initialization condition.
Setting range: RX
SB

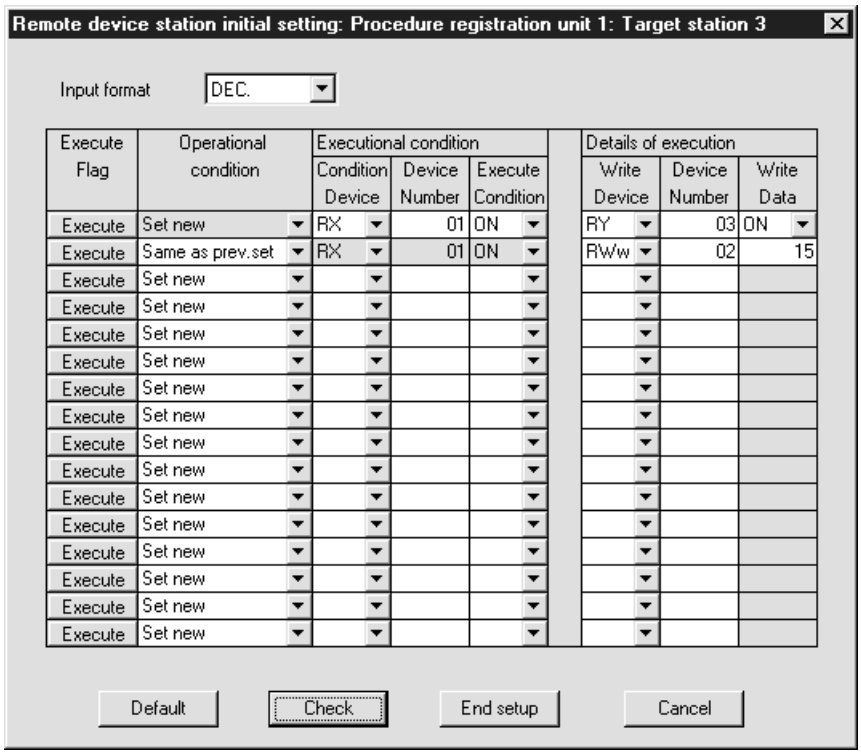
5) Executional condition settings "Device Number"
Set the device number to be used for the initialization condition.
Setting range: When RX is selected 0 to 37F (H)
When SB is selected 0 to FF (H)

6) Executional condition settings "Execute Condition"
Set the conditions under which initialization is performed.
Setting range: ON
OFF

7) Details of execution "Write Device"
Set the device to which the contents of the initial setting are written.
Setting range: RY
RWw

8) Details of execution "Device Number"
Set the device number to which the contents of the initial settings are written.
Setting range: When RY is selected 0 to 37F (H)
When RWw is selected 0 to 0F (H)

9) Details of execution "Write Data"
Set the contents of the initial settings.
Setting range: When RY is selected ON/OFF
When RWw is selected 0 to 65535 (Decimal),
0 to FFFF (Hexadecimal)




## (2) Validate initial settings

Before creating a program for communication with remote device stations, create a program to validate the initial settings that use SB0D (remote device station initialization procedure registration instruction) and SB5F (completion status of remote device station initialization procedure).
For more details, see Sections 10.1.4, 10.2.4 and 10.3.4.

## (3) Preparation for communication with remote device stations

1) Register the network parameters and the created program in the PLC CPU.
2) Reset the PLC CPU or turn the power from off to on.
3) Instruct the master station to register the remote device station initialization procedure. (This instruction may not be necessary in some cases such as when the remote input RX is set as a startup condition.)

POINT

(1) Because one step is performed per link scan, as the number of settings increases the processing time will extend beyond that specified in the sequence program.

(2) While SB0D (remote device station initialization procedure registration instruction) is on, the refresh of the remote input/output and remote registers stops.

(3) When the remote device station initialization procedure registration instruction (SB000D) turns OFF after completion of the initial processing, all of RY signals that have turned ON during the registration turn OFF.
Therefore, for signals that should be kept ON (e.g. CH.□ Conversion enable flag of the AJ65BT-64RD3/4), turn them ON in the sequence program.

(4) The remote device station initialization procedure execution complete status (SB005F) does not turn ON unless the procedure registration for all stations that are set to the remote device station initialization procedure registration is completed.
If any error station exists, turn OFF the remote device station initialization procedure registration instruction (SB000D) depending on the status of the other stations.

(5) The remote device station initialization procedure registration is not allowed for the standby master station.
When replacing a remote device station while the standby master station is operating as a master, perform initial setting on the sequence program.


4 - 48

## 4.4.2 Performing high-speed processing (Event issuance for the interrupt program)

This function issues events (signals to execute an interrupt program) according to factors such as the on/off status of specified RX, RY and SB devices and the match/mismatch status of specified RWr and SW device data, in order to allow the PLC CPU to execute the interrupt program.
Because the conditions for issuing the events are set using the GX Developer, the number of program steps is reduced, thus shortening the scan time.
Events can be issued for all stations.
A maximum of 16 event issuance conditions can be set.

### (1) Event issuance conditions

Events are issued under the following conditions:
On/off status of specified RX, RY and SB devices
Match/mismatch status of specified RWr and SW device data
When the link scan is completed

### (2) Event issuance condition setting method

(a) First, set the "Interrupt setting" in the network parameters.

1) Input format
Set the data input format for "Word device".
Setting range: DEC.
HEX.
Default: DEX.

2) Device code
Set the device to be used for the event issuance conditions.
Setting range: RX
SB
RY
RWr
SW
Scan completed

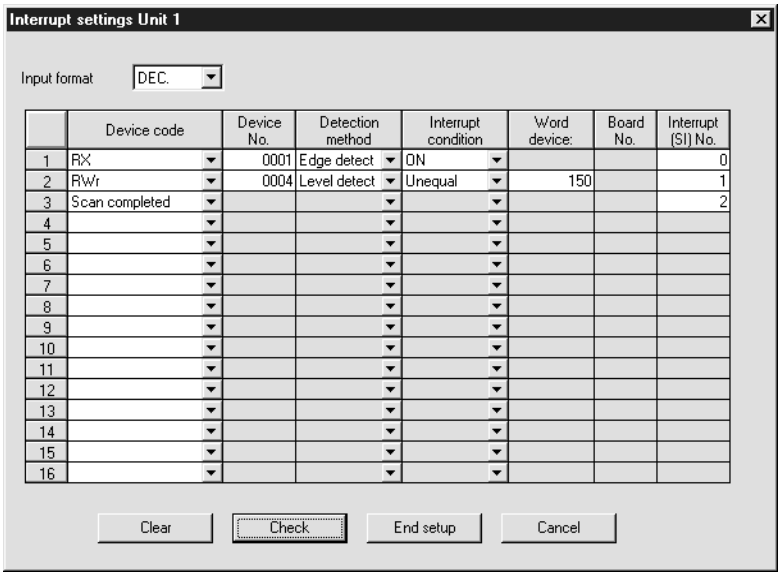
3) Device No.
Set the device number to be used for the event issuance conditions.
Setting range: When RX or RY is selected 0 to 1FFF (H)
When SB or SW is selected 0 to 01FF (H)
When RWr is selected 0 to 00FF (H)

4) Detection method
Set the detection method for the event issuance conditions.
Setting range: Edge detect (Issues event only at rise and fall.)
Level detect (Issues each link scan event when the event issuance conditions are established.)

5) Interrupt condition
Set the conditions under which events are issued.
Setting range: When RX, SB or RY is selected ON/OFF
When RWr or SW is selected Equal/Unequal

6) Word device
Set the conditions under which events are issued when RWw or SW is selected.
Setting range: 0 to 65535 (Decimal)
0 to FFFF (Hexadecimal)

7) Interrupt (SI) No.
Set the intelligent function module interrupt pointer number.
(SI is an interrupt pointer for an intelligent function module and not a device used in an actual program.)
Setting range: 0 to 15




**POINT**

Only one event issuance condition can be set for each interrupt program.

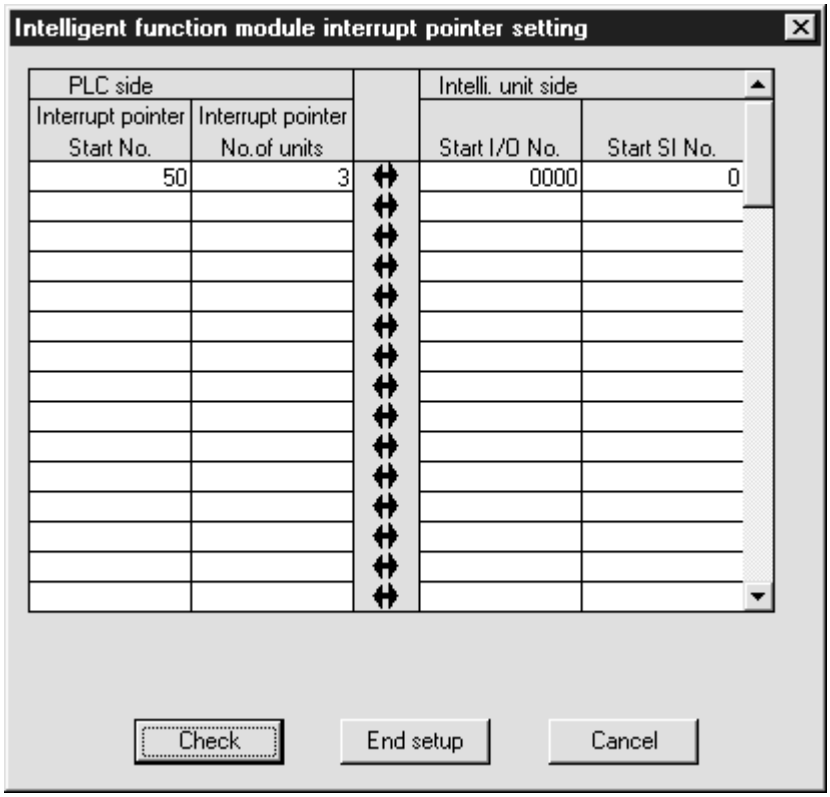
(b) Set the "PLC parameter" -- "PLC system" -- "Intelligent function module setting" -- "Interrupt pointer settings".

1) "Interrupt pointer start No." on the PLC side.
Set the interrupt pointer start number for the CPU.
Setting range: 50 to 255

2) "Interrupt pointer No. of units" on the PLC side
Set the number of event issuance conditions specified in the "Interrupt settings" of the Network parameters
Setting range: 1 to 16

3) "Start I/O No." on the Intelli. unit side
Set the start input/output number for the intelligent function module for which the interrupt setting was performed.
Setting range: 0 to 0FF0 (H)

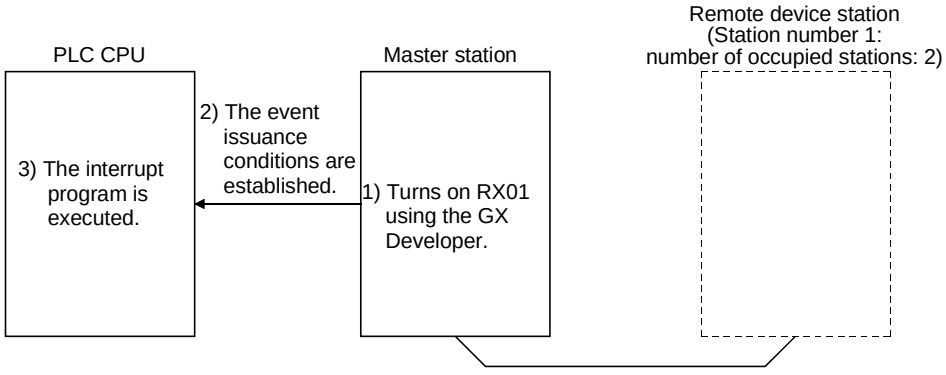
4) "Start SI No." on the intelli. unit side
Set the smallest number for intelligent function module interrupt pointers specified in "Interrupt (SI) No." of the "Interrupt settings" in the Network parameters.
Setting range: 0 to 15




## (3) Simulation of the interrupt program

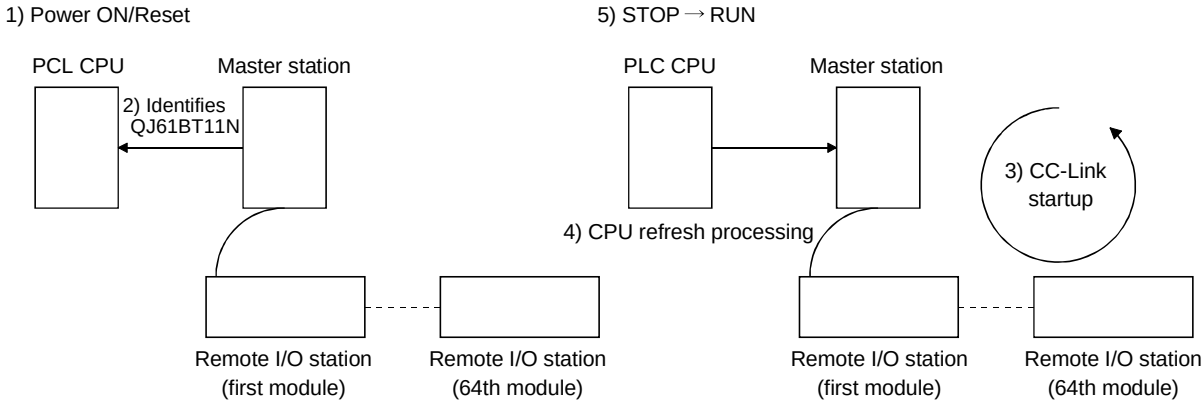
When the event issuance conditions are established in the master station using the GX Developer, the interrupt program is executed even when the corresponding modules are not connected, and then the interrupt program can be simulated.

(Example) A case where an event is issued when RX01 turns on, and then an interrupt program is executed.


Remote device station
(Station number 1:
number of occupied stations: 2)
PLC CPU
Master station
2) The event issuance conditions are established.
3) The interrupt program is executed.
1) Turns on RX01 using the GX Developer.

## 4.4.3 Enabling the data link simply by powering on (Automatic CC-Link startup)

When the QJ61BT11N is used in a system configuration including not only remote I/O stations but also remote device stations and intelligent device stations, the CC-Link startup and data refresh are performed only by powering up the system and without creating sequence programs.
Use this function to make an operation check when constructing a system. When performing control, always set the network parameters.




### (1) Contents of default parameter settings at automatic CC-Link startup

The following lists the contents of the default automatic refresh parameter settings and network parameter settings when the automatic CC-Link starts up.

Content of default automatic refresh parameter settings

| Q02/Q02H/Q06H/ Q12H/Q25H/Q12PH/ Q25PHCPU side | Direction | Master station/ local station side | Q00J/Q00/Q01CPU side | Direction | Master station/ local station side |
|---|---|---|---|---|---|
| X1000 to X17FF | ← | RX0000 to RX07FF | X400 to X7FF | ← | RX000 to RX3FF |
| Y1000 to Y17FF | → | RY0000 to RY07FF | Y400 to Y7FF | → | RY000 to RY3FF |
| W1E00 to W1EFF | ← | RWr00 to RWrFF | W600 to W67F | ← | RWr00 to RWr7F |
| W1F00 to W1FFF | → | RWw00 to RWwFF | W700 to W77F | → | RWw00 to RWw7F |
| SB0600 to SB07FF | ← | SB0000 to SB01FF | SB200 to SB3FF | ← | SB0000 to SB01FF |
| SW0600 to SW07FF | ← | SW0000 to SW01FF | SW200 to SW3FF | ← | SW0000 to SW01FF |

Content of default network parameter settings

| | |
|---|---|
| Mode setting | Remote net ver.1 mode |
| Total number of connected stations | 64 stations |
| Number of retries | 3 times |
| Number of automatic return modules | 1 module |
| Standby master station number | No standby master station specified. |
| CPU down specification | Data link stop when a master station CPU error occurs |
| Scan mode setting | Asynchronous |
| Delay time setting | 0 |

Content of buffer memory size specification for intelligent device station

| | |
|---|---|
| Send buffer | 64 words |
| Receive buffer | 64 words |
| Automatic update buffer | 128 words |

POINT

(1) Perform an automatic CC-Link startup in the remote net ver. 1 mode.

(2) When the automatic CC-Link startup is executed on a local station, the local station operates occupying 1 station.

(3) Make sure to perform line tests for all stations if an automatic CC-Link startup is performed and changes such as replacement of a module, etc. are made to the system during data link operation.
Stations whose data link has already been established (only stations whose station numbers overlap) may also go down if stations with overlapping head station numbers return to the system.

(4) If an automatic CC-Link startup was performed, a temporary error invalid station cannot be used.

(5) In case of a multiple PLC system where each CPU controls several QJ61BT11N modules, the automatic CC-Link startup is performed on the QJ61BT11N that has the smallest head I/O number.

(6) In the Q00J/Q00/Q01CPU, automatic refresh is performed for stations No.1 to 32 only.
Because automatic refresh is not performed for station No. 33 or higher, use FROM/TO instructions to read/write data.

## (2) Execution conditions

(a) When the parameters are not set, the automatic CC-Link startup function is applicable only to one "QJ61BT11N". Even when more than one QJ61BT11N is mounted on the base unit, the automatic CC-Link startup function is applicable only to the first one. It is applied to the QJ61BT11N that has the smallest start I/O number, as seen from the PLC CPU side.

(b) When performing an automatic CC-Link startup without setting the parameters, up to three MELSECNET/H modules can be used on the master station CPU.

### 4.4.4 Communicating with intelligent device stations (Remote net mode)

The remote net mode allows communication with all stations (remote I/O stations, remote device stations, local stations, intelligent device stations, and standby master stations). Furthermore, it allows not only cyclic transfer, but also transient transmission, which transfers data at an arbitrary timing, to intelligent and local stations.

[Setting method]

Set the remote net mode in "Mode" of the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.5.

### 4.4.5 Speeding up the response from remote I/O stations (Remote I/O net mode)

The remote I/O net mode can be used for a system consisting of only the master station and remote I/O stations. The remote I/O net mode allows cyclic transmission at high speed, thus shortening the link scan time.
The table below lists the link scan times for both the remote I/O net mode and the remote net mode.

Table 4.7

| Number of stations | Remote I/O net mode | Remote net mode |
|---|---|---|
| 8 | 0.61 ms | 1.2 ms |
| 16 | 0.94 ms | 1.6 ms |
| 32 | 1.61 ms | 2.3 ms |
| 64 | 2.94 ms | 3.8 ms |

(Transmission rate: at 10 Mbps)

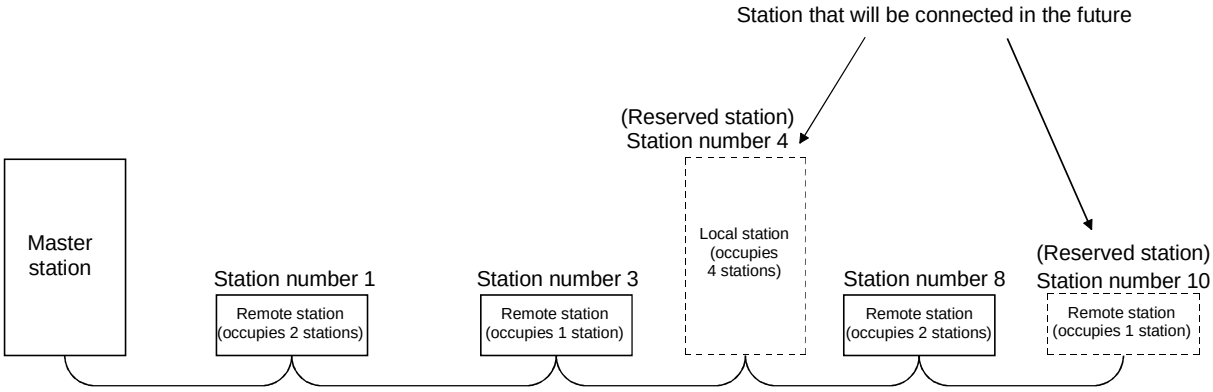
[Setting method]

Set the remote I/O net mode in "Mode" of the network parameters using GX Developer. For more details on the setting, see Section 6.6.


4 - 54

## 4.4.6 Creating a program that contains modules to be added in the future (Reserved station function)

This function prevents remote stations, local stations, intelligent device stations, and a standby master station that are not actually connected (but to be connected in the future) from being treated as "data link faulty stations" by the master station and local stations.
When the master station is placed in the remote net ver.2 mode, points for reserved stations can be set to 0.
Use GX Developer to set 0 points for reserved stations.
Although dedicated instructions are not usable for this setting, if reading from or writing to reserved stations is disabled when refreshing cyclic data with FROM/TO instructions, the same result is obtained.




**POINT**

If a connected remote station, local station, intelligent device station, or standby master station is specified as a reserved station, data link with the specified station becomes disabled.

[Setting method]

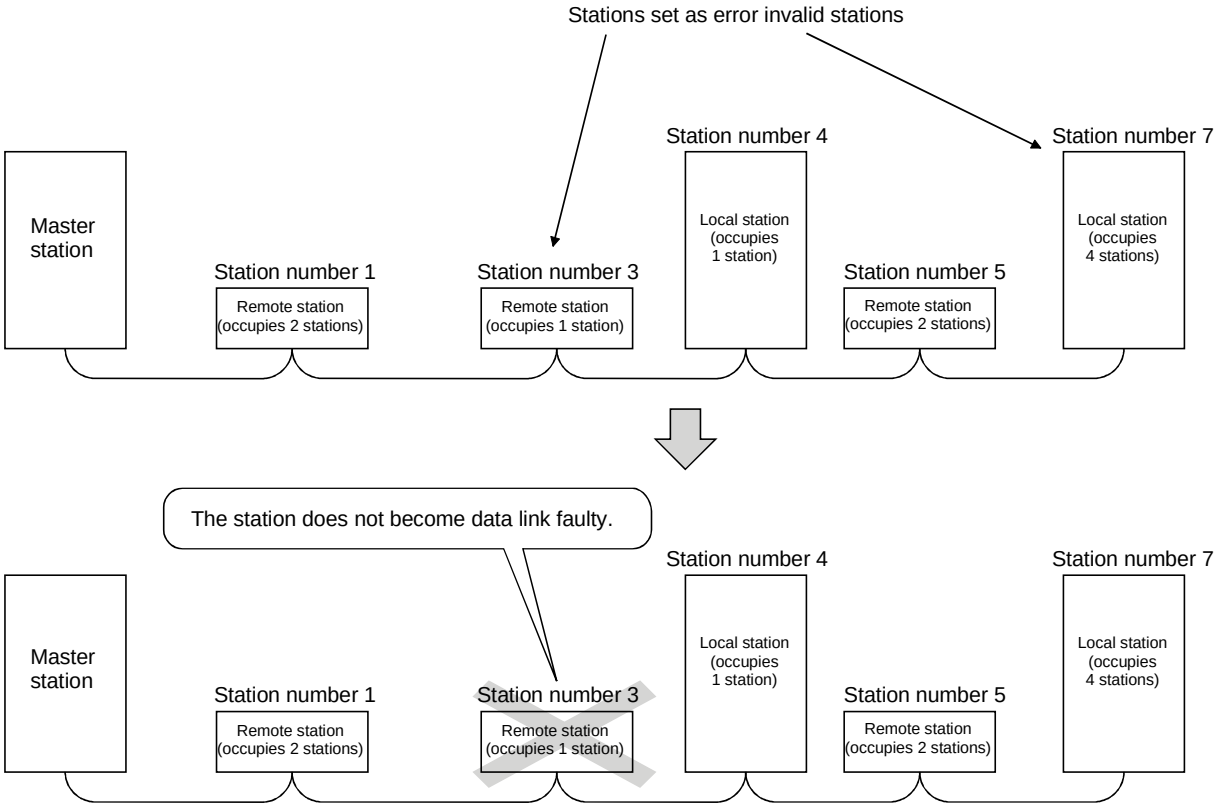
Set the reserved function in "Station information setting" of the network parameters using the GX Developer.

- Make reserved station setting by choosing "Station information setting" - "Reserve/invalid station select".
- Make 0 points setting for the reserved station by choosing "Station information setting" - "Remote station points".

For more details on the setting, see Sections 6.3 to 6.5.

## 4.4.7 Powering off a station in operation without error detection (Error invalid station setting function)

This function prevents remote stations, local stations, intelligent device stations, and a standby master station that are powered off in the system configuration from being treated as "data link faulty stations" by the master station and local stations, using the network parameter settings.
Note that if a station is set as an error invalid station, problems occurring in that station can no longer be detected. In addition, the error invalid station settings cannot be changed while online because they are set with the network parameters.


Stations set as error invalid stations
Master station
Station number 1
Remote station (occupies 2 stations)
Station number 3
Remote station (occupies 1 station)
Station number 4
Local station (occupies 1 station)
Station number 5
Remote station (occupies 2 stations)
Station number 7
Local station (occupies 4 stations)
The station does not become data link faulty.
Master station
Station number 1
Remote station (occupies 2 stations)
Station number 3
Remote station (occupies 1 station)
Station number 4
Local station (occupies 1 station)
Station number 5
Remote station (occupies 2 stations)
Station number 7
Local station (occupies 4 stations)

**POINT**

(1) If a remote station, a local station, an intelligent device station or the standby master station that is set as an error invalid station is "specified as a reserved station," the reserved station function overrides the error invalid station setting function.

(2) If errors are generated at all the stations when they are set as error-invalid stations, the "ERR." LED will light.

[Setting method]

Set the error invalid station setting function in "Station information setting" of the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.


4 - 56

## 4.4.8 Synchronizing the link scan with the sequence scan (Scan synchronous function)

This function selects whether or not the link scan should be synchronized with the sequence scan.

### (1) Synchronous mode

Performs data linking using the scan that is synchronized with the sequence program.
(The sequence scan and link scan start at the same time.)
In the synchronous mode, the link scan interval becomes longer when the sequence scan takes long because the link scan is synchronized with the sequence scan.

**IMPORTANT**

While in the synchronous mode, the sequence scan time must not exceed the time specified for the corresponding transmission rate, as listed below. If the scan time exceeds the specified time, a time out error occurs at each station.

| Transmission rate | Sequence scan time |
|---|---|
| 10 Mbps | 50 ms |
| 5 Mbps | 50 ms |
| 2.5 Mbps | 100 ms |
| 625 Mbps | 400 ms |
| 156 Mbps | 800 ms |

**POINT**

(1) The asynchronous mode is recommended for a mixed system of local stations A(1S)J61BT11 and A(1S)J61QBT11 when the QJ61BT11N is used as the master station. When using the synchronous mode, make sure to observe the restrictions in (2) and (3) below.

(2) When using a system consisting of the QJ61BT11N as the master station in the synchronous mode and both the A(1S)J61BT11 and A(1S)J61QBT11 as local stations, set the sequence scan time of the local station CPU to be shorter than ST. For more details on "ST," see Section 5.1.

(3) When using a system consisting of the QJ61BT11N as the master station in the synchronous mode and both the A(1S)J61BT11 and A(1S)J61QBT11 as local stations, use XnC as an interlock of the FROM/TO instructions on the local station CPU side.

(4) When operating in the synchronous mode, the "L RUN" LED may be lit dimly.

### (2) Asynchronous mode

Performs data linking without synchronizing with the sequence program.

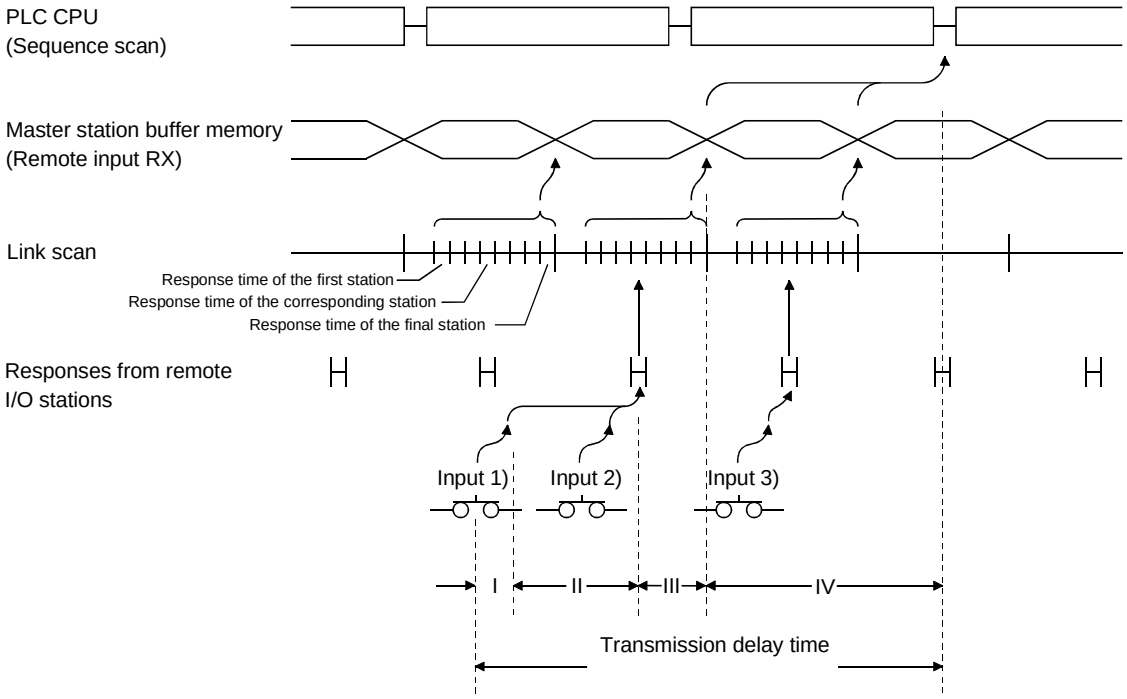
### (3) Setting method

Set the scan synchronous function in "Scan mode setting" of the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

### (4) Data flows in synchronous and asynchronous modes

The data flows in both the synchronous and asynchronous modes are explained using examples of communications between the master station and remote I/O stations.

(a) Data flow in the asynchronous mode

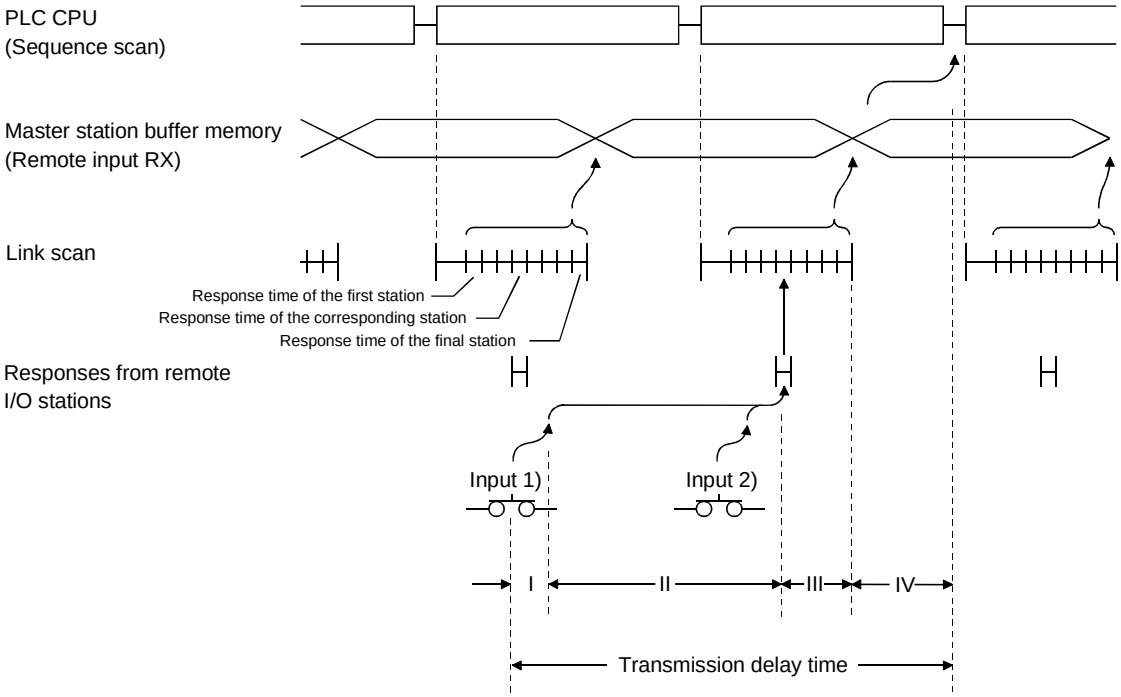



I: Delay time due to response delay of remote I/O station
II: Delay time of transmission from the remote I/O station to the master station
III: Delay time from reception by the master station to storage in the buffer memory
IV: Delay time until the master station's information is refreshed in the PLC CPU


4 - 58

(b) Data flow in the synchronous mode

1) Sequence scan ≧ Link scan




I: Delay time due to response delay of remote I/O station

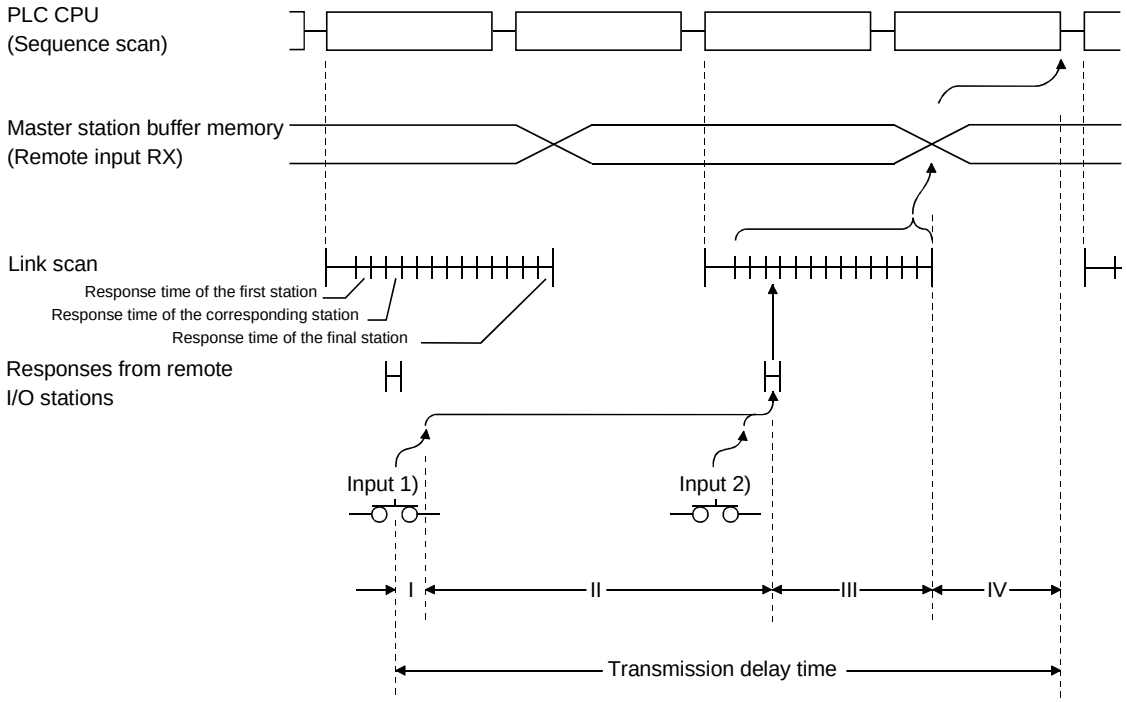
II: Delay time of transmission from the remote I/O station to the master station

III: Delay time from reception by the master station to storage in the buffer memory

IV: Delay time until the master station's information is refreshed in the PLC CPU


4 - 59

2) Sequence scan < Link scan




I: Delay time due to response delay of remote I/O station

II: Delay time of transmission from the remote I/O station to the master station

III: Delay time from reception by the master station to storage in the buffer memory

IV: Delay time until the master station's information is refreshed in the PLC CPU


4 - 60

## 4.4.9 Replacing modules without error detection (Temporary error invalid station setting function)

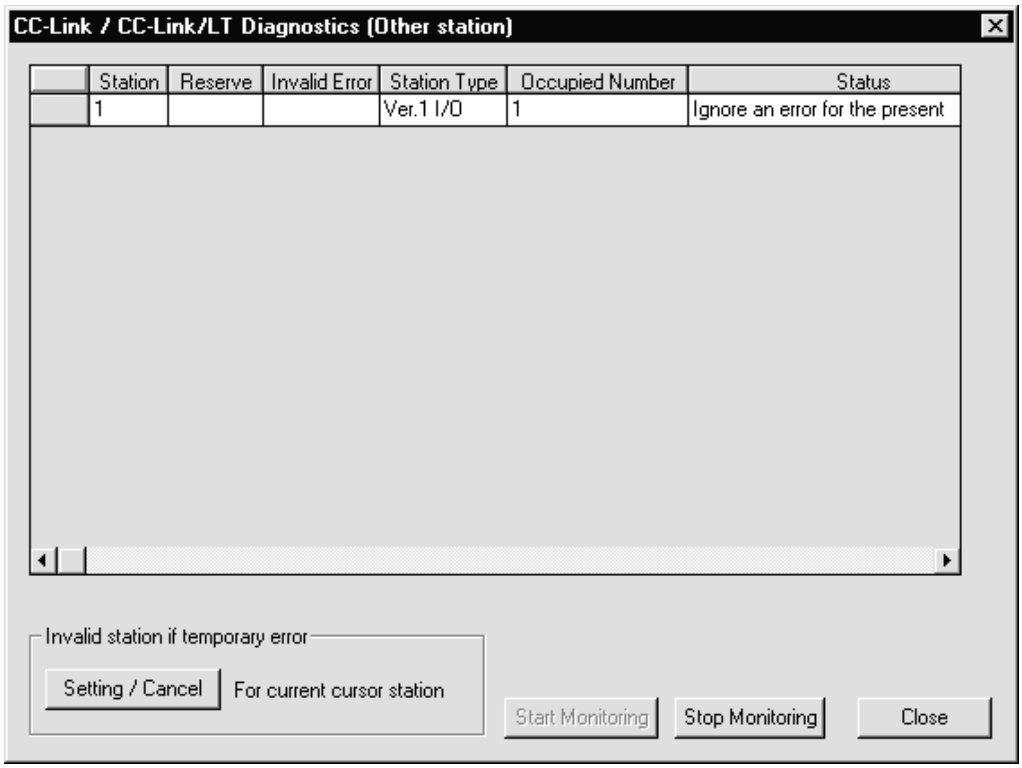
This function prevents remote stations, local stations, intelligent device stations, and the standby master station that are specified with the GX Developer from being treated as "data link faulty stations" while online. It allows the replacement of modules while online without error detection.

### (1) Input/output status at temporary error invalid station setting

All the cyclic transmission data of the stations set as temporary error-invalid stations is refreshed. However, when a station set as a temporary error-invalid station becomes faulty, the input is retained and the output switches off.

### (2) Setting method

Set the "Diagnostics" - "CC-Link / CC-Link/LT Diagnostics" - "Monitoring other station ..." - "Invalid station if temporary error" using the GX Developer. Place the cursor at the station to be set as a temporary error invalid station and click "Setting/Cancel".



## 4.4.10 Checking operations for each local station (Data link stop/restart)

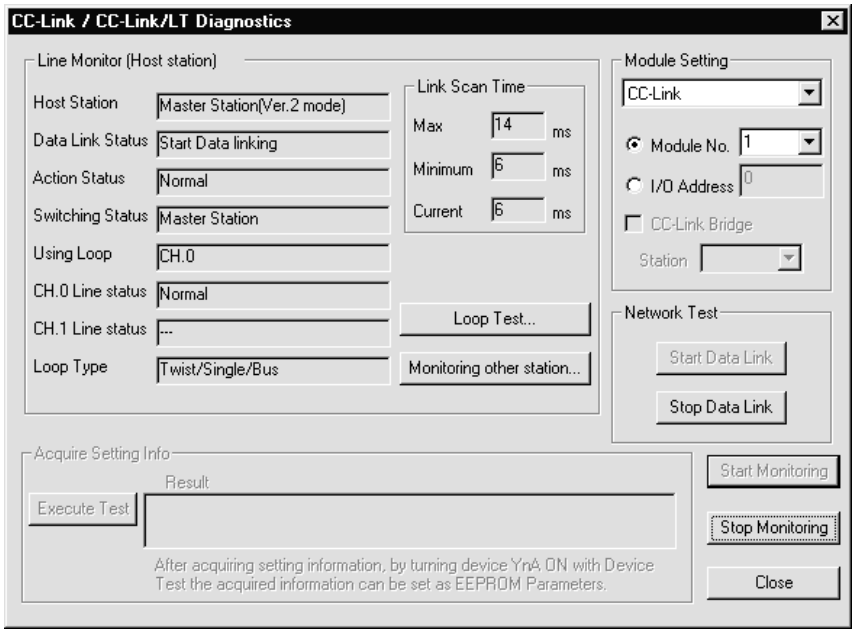
This function stops and restarts local data links. If the data link of the master station is stopped, the data link of the entire system stops.

### [Setting method]

Set the "CC-Link / CC-Link/LT Diagnostics" in "Diagnostics" using the GX Developer.

(a) Specifying applicable module
Specify the module whose data link is stopped or restarted in "Module setting".
Specification method: Module No.
I/O Address

(b) Execution of data link stop/restart
Perform these operations by setting "Start Data Link" or "Stop Data Link" in the network test.



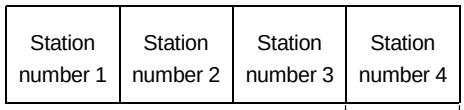
## 4.4.11 Station number overlap checking function

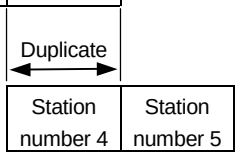
This function investigates the status of connected stations and checks for the overlapping numbers of number of occupied stations and whether or not more than one station whose station number setting is 0 exists in the system.

### (1) Number of occupied station number overlap checking

Checks whether or not occupied station numbers duplicate.
(Example)

Local station (station number 1, number of occupied stations: 4)



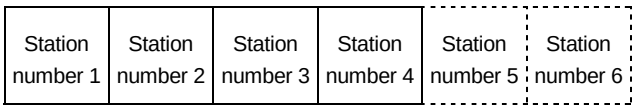



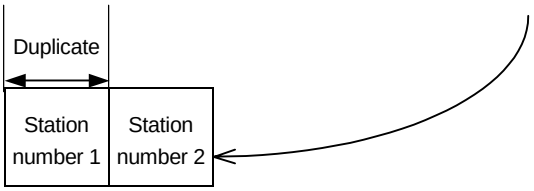

Remote device station
(station number 4, number of occupied stations: 2)

1) When there is an duplicate, the "ERR." LED flashes, and the duplicate status is stored in SW0098 to SW009B (Station number overlap status).
2) Even if an overlap exists, the data link continues with the remaining normally functioning stations.
3) By correcting the switch setting to normal and resetting the PLC CPU of the master station, the "ERR." LED is turned off and the data in SW0098 to SW009B can be cleared.

However, if the starting station number overlaps, it is excluded from the overlap checking.
(Example)

Local station (station number 1, number of occupied stations: 4)




Remote device station
(station number 1, number of occupied stations: 2)

Check the other station data link status (SW0080 to SW0083) for a data link error. The station number setting of the station where a data link error has occurred may be wrong.

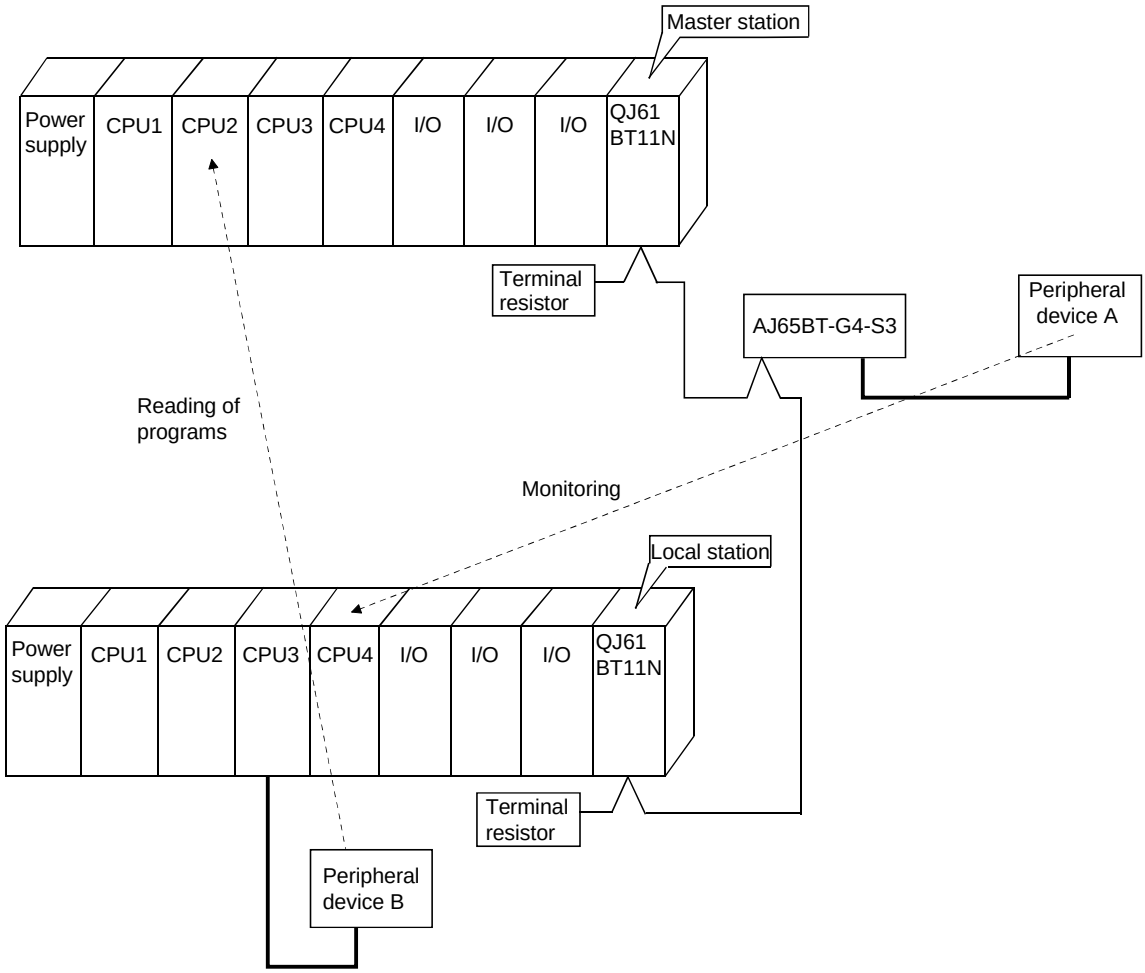
### (2) Station number 0 station overlap checking

Checks whether or not more than one station whose station number setting is 0 exists in the system.

1) When duplicating, the "ERR." LED lights up, an error code is stored in SW006A (switch setting status), and SB006A (switch setting status) turns on.
2) By correcting the switch setting to normal and restarting the data link, the "ERR." LED is turned off and the data in SW006A can be cleared.

## 4.4.12 Multiple PLC system support

This function allows monitoring and reading/writing programs from/to any CPU in a multiple PLC system mounted with the QJ61BT11N via AJ65BT-G4-S3 or other station CPUs.
This is illustrated by the following example.
It is possible to monitor CPU4 of the local station from peripheral device A connected to the AJ65BT-G4-S3 and read the programs of CPU2 of the master station from peripheral device B connected to CPU3 of the local station.
This function cannot be used with function version A.

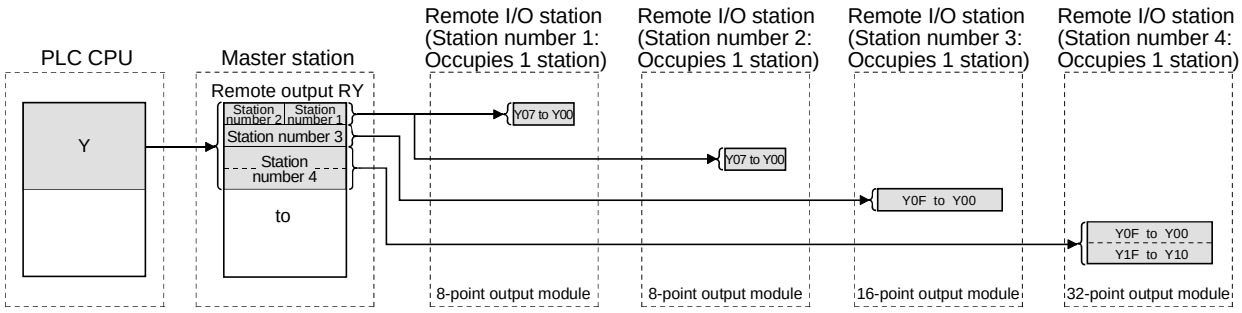



| POINT |
| --- |
| Access source CPUs must be control PLCs in order to make an access. |


4 - 64

## 4.4.13 Reducing the reserved points of the remote I/O stations (Remote I/O station points setting)

The points of each remote I/O station can be set to 8, 16 or 32 points.
This saves the refresh device points of the PLC CPU.
The remote I/O station points setting can be used in the remote net ver. 2 mode only.
For parameter setting, use GX Developer of version 8.03D or later.
This function cannot be executed if the dedicated instruction is used for parameter setting. This function can be executed when read/write from/to the CPU devices is performed according to the I/O points of each station at cyclic data refresh using the FROM/TO instruction.

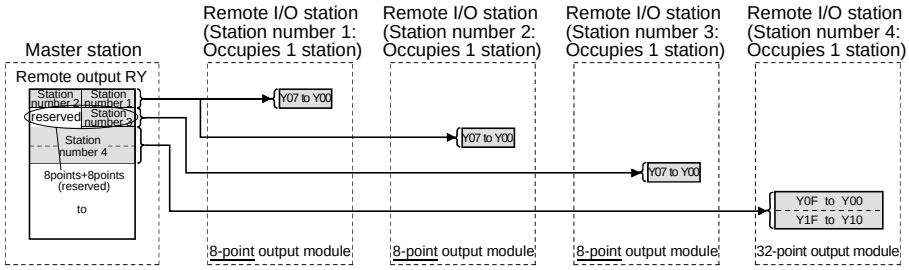



Device area when remote I/O points setting is made

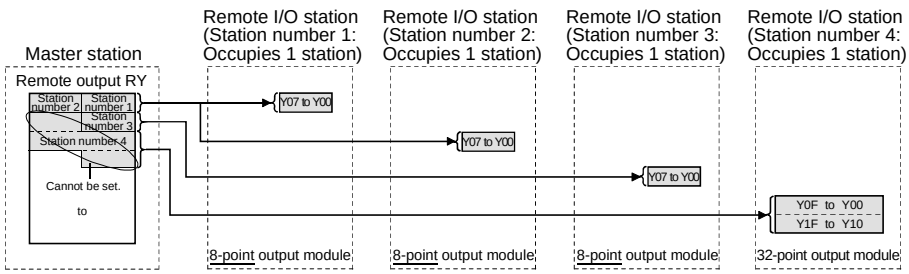
Device area when remote I/O points setting is not made

### POINT

Set points to even-numbered 8-point setting remote I/O stations consecutively. If points are set to odd-numbered 8-point setting remote stations, select 8 points + 8 points reserved in the "remote station points" setting of the last of the consecutive remote I/O stations.




Odd-numbered 8-point setting remote stations cannot be set for 8 remote station points.


Master station
Remote output RY
Station number 2
Station number 1
Station number 3
Station number 4
Cannot be set.
to
Remote I/O station (Station number 1: Occupies 1 station)
Remote I/O station (Station number 2: Occupies 1 station)
Remote I/O station (Station number 3: Occupies 1 station)
Remote I/O station (Station number 4: Occupies 1 station)
Y07 to Y00
Y07 to Y00
Y07 to Y00
Y0F to Y00
Y1F to Y10
8-point output module
8-point output module
8-point output module
32-point output module

Refer to Section 6.2 for parameter setting.

[Setting method]

Using GX Developer, make setting by choosing "Station information setting" - "Remote station points" in the network parameter dialog box. For more details on the setting, see Sections 6.3 to 6.5.

(1) Precautions for setting the remote I/O station points

The number of parameter-set remote I/O station points should be equal to or greater than the number of I/O points of the mounted remote I/O stations. If it is less than the number of I/O points of the mounted remote I/O stations, the inputs/outputs after the set number of points will not operate normally.

## 4.4.14 Increasing the number of cyclic points (Remote net ver.2 mode)

This function increases the number of cyclic points.
When increasing the number of cyclic points, select one from the following two modes.

- Remote net ver.2 mode ..... Mode suitable for configuring a new system
- Remote net additional mode..... Mode suitable for adding a ver. 2 compatible slave station to the existing ver. 1 system

In the remote net ver. 1 mode, the number of cyclic points cannot be increased.
When using GX Developer for setting, use Version 8.03D or later.

The number of cyclic points per module can be increased as indicated in the following table.

Table 4.8

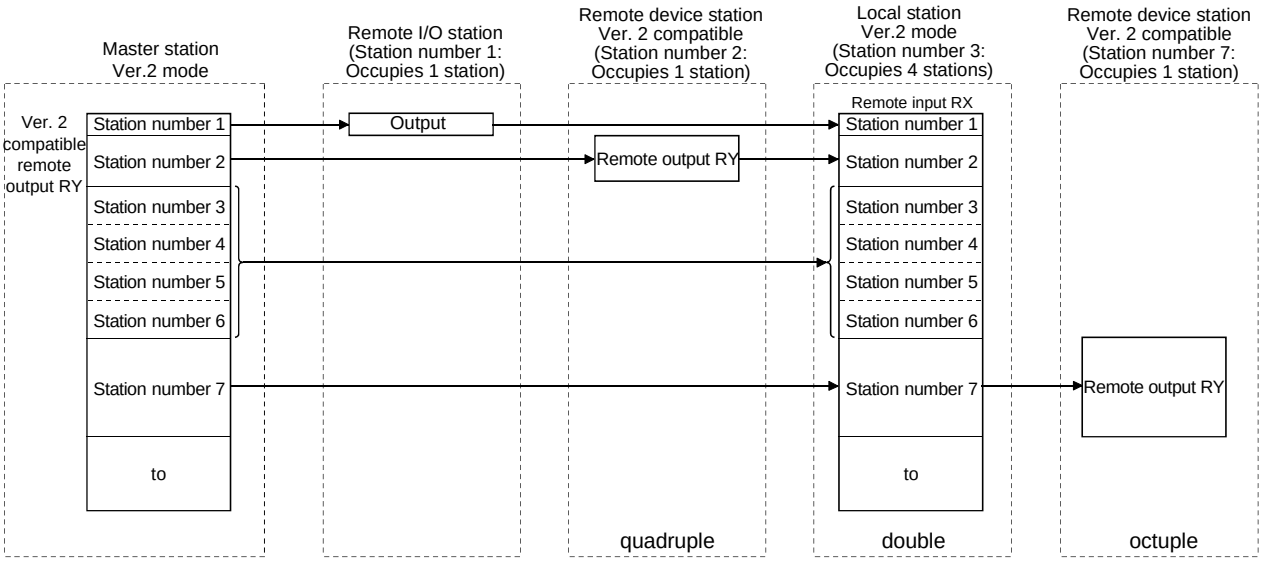
| | | Expanded cyclic setting | | | |
|---|---|---|---|---|---|
| | | single | double | quadruple | octuple |
| Occupies 1 station | Remote I/O (RX, RY) | 32 points | 32 points | 64 points | 128 points |
| | Remote register (RWw , RWr) | 4 points | 8 points | 16 points | 32 points |
| Occupies 2 stations | Remote I/O (RX, RY) | 64 points | 96 points | 192 points | 384 points |
| | Remote register (RWw , RWr) | 8 points | 16 points | 32 points | 64 points |
| Occupies 3 stations | Remote I/O (RX, RY) | 96 points | 160 points | 320 points | 640 points |
| | Remote register (RWw , RWr) | 12 points | 24 points | 48 points | 96 points |
| Occupies 4 stations | Remote I/O (RX, RY) | 128 points | 224 points | 448 points | 896 points |
| | Remote register (RWw , RWr) | 16 points | 32 points | 64 points | 128 points |

### (1) Remote net ver.2 mode

This mode is designed to configure a new system.

The number of cyclic points can be increased as indicated below.

- Per station, RX/RY can be increased to up to 128 points and RWw/RWr to up to 32 points.
- Per CC-Link network, RX/RY can be increased to up to 8192 points and RWw/RWr to up to 2048 points.




**POINT**

(1) In the remote net ver. 2 mode, the remote registers of the remote I/O station are set to 0 points.

(2) When the ver. 2 compatible slave station is added or deleted, the refresh devices of the PLC CPU will vary by the number of points set to the added or deleted slave station in the slave stations of the station numbers after the added or deleted slave station. Confirm the varying number of points in Table 4.8.

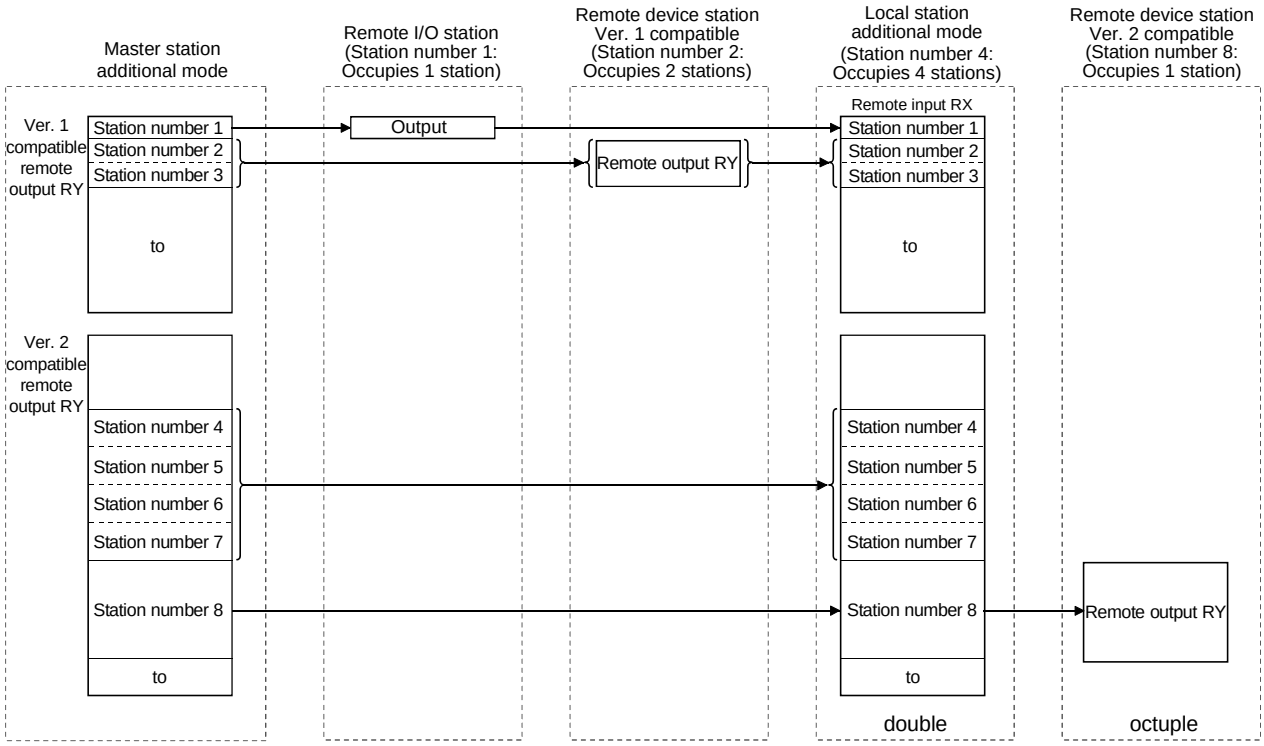
[Setting method]

Using GX Developer, set the network parameters.

For more details on the setting, see Sections 6.3 to 6.5.

(2) Remote net additional mode

This mode is designed for use when slave stations including a ver. 2 compatible station is added to the existing ver. 1 system.
The program of the existing system can be used as is.


Master station additional mode
Remote I/O station (Station number 1: Occupies 1 station)
Remote device station Ver. 1 compatible (Station number 2: Occupies 2 stations)
Local station additional mode (Station number 4: Occupies 4 stations)
Remote device station Ver. 2 compatible (Station number 8: Occupies 1 station)
Ver. 1 compatible remote output RY
Station number 1
Station number 2
Station number 3
to
Output
Remote output RY
Remote input RX
Ver. 2 compatible remote output RY
Station number 4
Station number 5
Station number 6
Station number 7
Station number 8
Remote output RY
double
octuple

POINT

(1) Set the station numbers of the slave stations to be added after the last station number used in the existing system.
In the above example, the slave stations are added to and after station No. 4 since the existing system uses up to station No. 3.

(2) When the ver. 2 compatible slave station is added or deleted, the refresh devices of the PLC CPU will vary by the number of points set to the added or deleted slave station in the slave stations of the station numbers after the added or deleted slave station. Confirm the varying number of points in Table 4.8.

(3) In the remote net additional mode, the ver. 2 compatible slave station must be placed in the latter half as described in (1).
When there is a possibility that ver. 1 compatible slave stations will be added in the future in the remote net additional mode, set multiple reserved stations after the ver. 1 compatible slave station to ensure ease of expanding the system.

(4) For the system that includes a standby master station, it is recommended to change for the remote net ver. 2 mode.
When the remote net additional mode is used, the sequence program for the standby master station must be corrected.

[Setting method]

Using GX Developer, set the network parameters.
For more details on the setting, see Sections 6.3 to 6.5.


4 - 69

## (3) Precautions for cyclic points increase setting

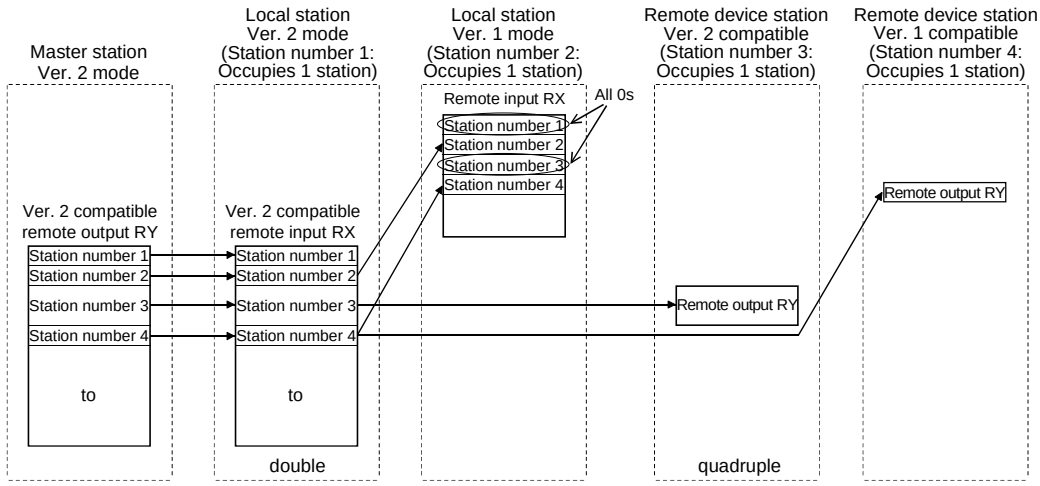
### (a) Whether system can be configured or not

The following table indicates whether cyclic transmission can be made or not in each station.

| Master station \ Slave station | | QJ61BT11N | | | | | | QJ61BT11 *3 AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11, A80BD-J61BT11, A80BD-J61BT13 | | Intelligent device station | | Remote station | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Local station | | | Standby master station | | | Local station | Standby master station | | | Remote device station | | Remote I/O station |
| | | Ver.2 mode | Additional mode | Ver.1 mode | Ver.2 mode | Additional mode | Ver.1 mode | Ver.1 mode | Ver.1 mode | Ver.2 compatible | Ver.1 compatible | Ver.2 compatible | Ver.1 compatible | Ver.1 compatible |
| QJ61BT11N | Ver.2 mode | ○ | × | △ *1 | ○ | × | × | △ *1 | × | ○ | ○ | ○ | ○ | ○ |
| | Additional mode | ○ *2 | ○ | △ *1 | × | ○ | × | △ *1 | × | ○ | ○ | ○ | ○ | ○ |
| | Ver.1 mode | × | × | ○ | × | × | ○ | ○ | ○ | × | ○ | × | ○ | ○ |
| QJ61BT11 *3 | Ver.1 mode | × | × | ○ | × | × | ○ | ○ | ○ | × | ○ | × | ○ | ○ |

○: Cyclic transmission enabled, △: Cyclic transmission enabled on condition, ×: Cyclic transmission disabled

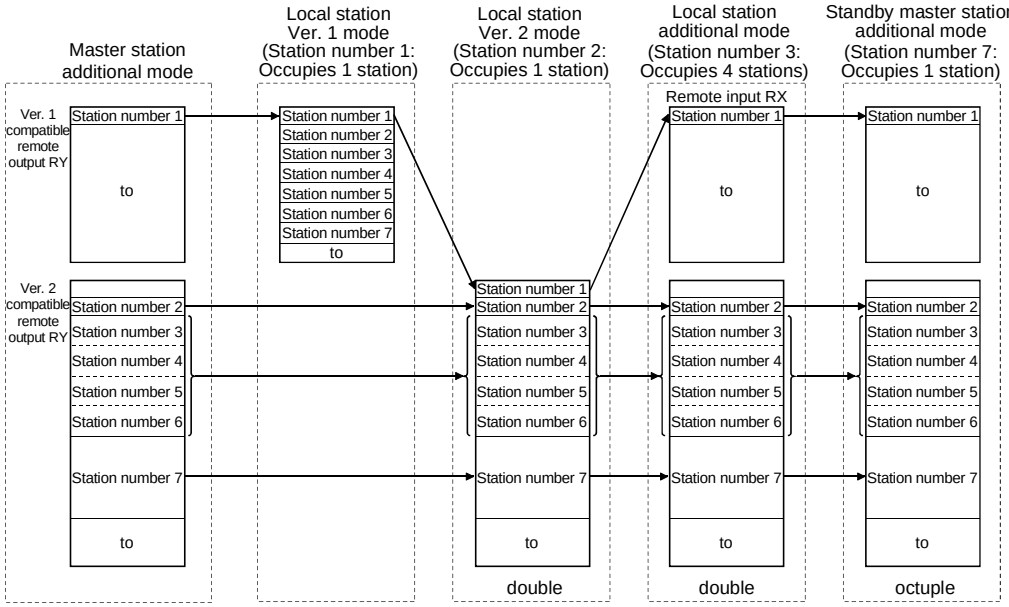
*1 When the master station is the QJ61BT11N in remote net Ver.2 mode or remote net additional mode, and when the local station is the QJ61BT 11N in remote net Ver.1 mode or the QJ61BT11, the local station can communicate with the master station. However, Ver.2 compatible stations are recognized as faulty so that data of these stations cannot be confirmed.





4 - 70

∗2 When the master station is in the remote net additional mode of the QJ61BT11N and the local station is in the remote net ver. 2 mode of the QJ61BT11N, a link is performed as shown in the following areas.


Master station additional mode
Local station Ver. 1 mode (Station number 1: Occupies 1 station)
Local station Ver. 2 mode (Station number 2: Occupies 1 station)
Local station additional mode (Station number 3: Occupies 4 stations)
Standby master station additional mode (Station number 7: Occupies 1 station)
Ver. 1 compatible remote output RY
Ver. 2 compatible remote output RY
Remote input RX
Station number 1
Station number 2
Station number 3
Station number 4
Station number 5
Station number 6
Station number 7
to
double
double
octuple

∗3 The remote net ver. 2 mode and remote net additional mode cannot be used with the QJ61BT11.

∗4 Data link is not available when the version set in the station type of the master station information is different from that of the remote station.
For example, when the station type of the master station information is set as "Ver.1 remote device station" although the actual remote device station is set to "Ver.2 remote device station", data link cannot be performed with the "ERR." LED on the master station flashing and the "L RUN" LED on the remote device station turned OFF.


4 - 71

(b) Whether send/receive is enabled or not

The following table indicates whether send/receive of cyclic data is enabled or not.

| Send station \ Receive station | | | | QJ61BT11N | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Master station | | | | | |
| | | | | Ver.2 mode | | Additional mode | | Ver.1 mode | |
| | | | | Ver. 2 compatible area | Ver. 1 compatible area | Ver. 2 compatible area | Ver. 1 compatible area | Ver. 2 compatible area | Ver. 1 compatible area |
| QJ61BT11N | Master station | Ver.2 mode | Ver. 2 compatible area | — | — | — | — | — | — |
| | | | Ver. 1 compatible area | — | — | — | — | — | — |
| | | Additional mode | Ver. 2 compatible area | — | — | — | — | — | — |
| | | | Ver. 1 compatible area | — | — | — | — | — | — |
| | | Ver.1 mode | Ver. 2 compatible area | — | — | — | — | — | — |
| | | | Ver. 1 compatible area | — | — | — | — | — | — |
| | Local station | Ver.2 mode | Ver. 2 compatible area | ○ | — | ○ | × | — | × |
| | | | Ver. 1 compatible area | — | — | — | — | — | — |
| | | Additional mode | Ver. 2 compatible area | — | — | ○ | × | — | — |
| | | | Ver. 1 compatible area | — | — | — | — | — | — |
| | | Ver.1 mode | Ver. 2 compatible area | — | — | — | — | — | — |
| | | | Ver. 1 compatible area | ○ | — | × | ○ | — | ○ |
| QJ61BT11 | Master station | Ver.1 compatible | | — | — | — | — | — | — |
| | Local station | Ver.1 compatible | | ○ | — | × | ○ | — | ○ |
| Intelligent device station | | Ver.2 compatible | | ○ | — | ○ | × | — | × |
| | | Ver.1 compatible | | ○ | — | × | ○ | — | ○ |
| Remote device station | | Ver.2 compatible | | ○ | — | ○ | × | — | × |
| | | Ver.1 compatible | | ○ | — | × | ○ | — | ○ |
| Remote I/O station | | Ver.1 compatible | | ○ | — | × | ○ | — | ○ |


4 - 72

| QJ61BT11N | | | | | | QJ61BT11 | | Intelligent device station | | Remote device station | | Remote I/O station |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Local station | | | | | | Master station | Local station | | | | | |
| Ver.2 mode | | Additional mode | | Ver1 mode | | | | | | | | |
| Ver. 2 compatible area | Ver. 1 compatible area | Ver. 2 compatible area | Ver. 1 compatible area | Ver. 2 compatible area | Ver. 1 compatible area | Ver.1 compatible | Ver.1 compatible | Ver.2 compatible | Ver.1 compatible | Ver.2 compatible | Ver.1 compatible | Ver.1 compatible |
| ○ | — | — | — | — | ○ | — | ○ | ○ | ○ | ○ | ○ | ○ |
| — | — | — | — | — | — | — | — | — | — | — | — | — |
| ○ | — | ○ | × | — | — | — | × | ○ | × | ○ | × | × |
| ○ | — | × | ○ | — | ○ | — | ○ | × | ○ | × | ○ | ○ |
| — | — | — | — | — | — | — | — | — | — | — | — | — |
| × | — | — | — | — | ○ | — | ○ | — | ○ | — | ○ | ○ |
| ○ | — | ○ | — | — | × | × | × | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — |
| ○ | — | ○ | × | — | × | × | × | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — |
| ○ | — | × | ○ | — | ○ | ○ | ○ | — | — | — | — | — |
| × | — | × | × | — | ○ | — | ○ | × | ○ | × | ○ | ○ |
| ○ | — | × | ○ | — | ○ | ○ | ○ | — | — | — | — | — |
| ○ | — | ○ | × | — | × | × | × | — | — | — | — | — |
| ○ | — | × | ○ | — | ○ | ○ | ○ | — | — | — | — | — |
| ○ | — | ○ | × | — | × | × | × | — | — | — | — | — |
| ○ | — | × | ○ | — | ○ | ○ | ○ | — | — | — | — | — |
| ○ | — | × | ○ | — | ○ | ○ | ○ | — | — | — | — | — |

○: Cyclic transmission enabled, ×: Cyclic transmission disabled, —:Prohibited


4 - 73

### (4) Mismatch in number of points between parameter-set expanded cyclic setting and installation status

If there is a mismatch in the number of points between the parameter-set expanded cyclic setting and installation status, the QJ61T11N stores the error code into SW0069. Also, it stores the matching status of each station into SW009C.

### (5) Precautions for modes between the master and local/standby master stations

At any of the following settings, an error (error code: B3A0) will occur at the local station/standby master station.
If the error has occurred, correct the mode in the parameter of the master station/local station/standby master station, and reset the PLC CPU.

- The mode set at the master station differs from the mode set at the standby master station.
- When the master station is set to the remote net ver. 1 mode, the local station is set to the remote net ver. 2 mode or remote net additional mode.
- When the master station is set to the remote net ver. 2 mode, the local station is set to remote net additional mode.

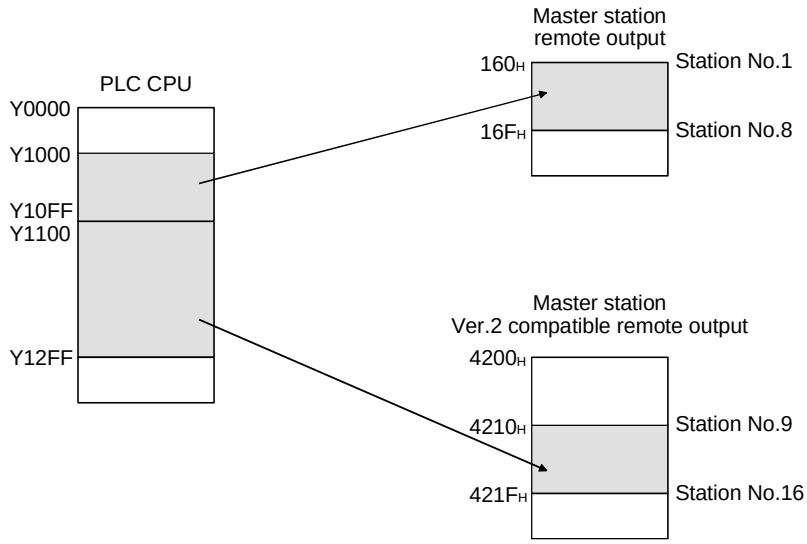
### (6) Automatic refresh setting

(a) By specifying refresh devices, automatic refresh is performed in the END processing of the PLC CPU.
The automatic refresh covers the areas from station No.1 to the station No. set with the network parameter (including occupied stations).

(b) When the remote net additional mode is selected, data of station No.1 to the last Ver.1 compatible station (including occupied stations) and data of Ver.2 compatible stations from its first station No. (the last Ver.1 compatible station No. +1) to the last station No. are automatically refreshed to devices specified in the first and last halves respectively.

(c) In the Ver.2 compatible remote register, data in the area up to the last remote device or intelligent device station No. are refreshed.

(Example) In the case where the remote net additional mode, Ver.1 compatible station: No. 1 to 8, Ver.2 compatible station: No. 9 to 16 (occupying 1 station, quadruple setting), refresh devices (first half): Y1000, and refresh devices (last half): Y1100 are set





4 - 74

## 4.5 Transient Transmission Functions

This section explains the transient transmission functions.

### 4.5.1 Performing transient transmission (Dedicated instructions)

The following dedicated instructions can be used for transient transmission.

| Applicable station | Instruction | Description | Reference section |
|---|---|---|---|
| Master station Local station | RIRD | Reads data from the buffer memory of a specified station or a PLC CPU device of a specified station. | Appendix 2.1 |
| | RIWT | Writes data to the buffer memory of a specified station or a PLC CPU device of a specified station. | Appendix 2.2 |
| Intelligent device station | RIRD | Reads data from the buffer memory of a specified station. | Appendix 2.1 |
| | RIWT | Writes data to the buffer memory of a specified station. | Appendix 2.2 |
| | RIRCV | Automatically performs a handshake with the specified station and reads data from that station's buffer memory. Available for modules that have handshake signals (e.g. AJ65BT-R2). | Appendix 2.3 |
| | RISEND | Automatically performs a handshake with the specified station and writes data to that station's buffer memory. Available for modules that have handshake signals (e.g. AJ65BT-R2). | Appendix 2.4 |
| | RIFR | Reads data from the automatic update buffer of a specified station. Available for modules that have the automatic update buffer (e.g. AJ65BT-R2). | Appendix 2.5 |
| | RITO | Writes data to the automatic update buffer of a specified station. Available for modules that have the automatic update buffer (e.g. AJ65BT-R2). | Appendix 2.6 |

# 5 DATA LINK PROCESSING TIME

This chapter explains the data link processing time such as the link scan time and transmission delay time.

## 5.1 Link Scan Time

This section explains the CC-Link scan time. The following describes the method for calculating the normal value and maximum value for the remote net mode or remote I/O net mode.

[Link scan time (LS)]

(1) For remote net mode

LS = BT {27 + (NI × 4.8) + (NW × 9.6) + (N × 30) + (ni × 4.8) + (nw × 9.6)} + ST + EX + F + TR (μs)

BT: Constant (transmission rate)

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BT | 51.2 | 12.8 | 3.2 | 1.6 | 0.8 |

NI: The final station number in a, b and c
(It includes the number of dedicated stations but excludes the reserved stations, and must be a multiple of 8.)
a: Total number of occupied stations for remote I/O stations
b: Total number of occupied stations for remote device stations
c: Total number of occupied stations for local stations, standby master station and intelligent device stations

NW: The final station number in b and c
(Includes the number of dedicated stations but excludes the reserved stations, and must be a multiple of 8.)

| Final station number | 1 to 8 | 9 to 16 | 17 to 24 | 25 to 32 | 33 to 40 | 41 to 48 | 49 to 56 | 57 to 64 |
|---|---|---|---|---|---|---|---|---|
| NI, NW | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 |

N: Number of connected stations (excluding reserved stations)
ni: a + b + c (excluding reserved stations)
nw: b + c (excluding reserved stations)
ST: Constant
A: Last station number of remote I/O stations
B: Last station number of remote device stations (including the number of occupied stations)
C: Last station number of local, standby master and intelligent device stations (including the number of occupied stations)
(The largest value found in 1) to 3) below. However, 2) is disregarded when B = 0 and 3) is disregarded when C = 0)
1) 800 + (A × 15)
2) 900 + (B × 50)
3) For C ≤ 26 : 1200 + (C × 100)
For C > 26 : 3700 + {(C - 26) × 25}

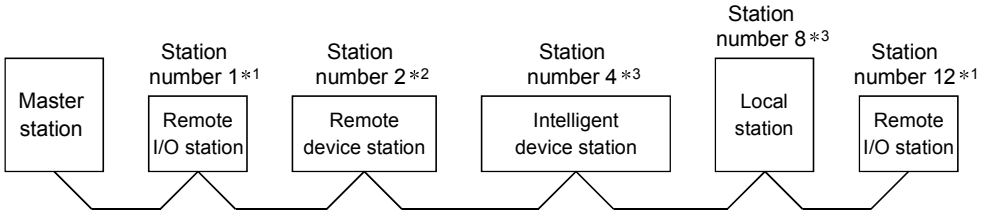
EX: Constant (only when remote net ver. 2 mode or remote net additional mode is used)
50 + total in the following table

| Number of occupied stations / Expanded cyclic setting | Occupies 1 station | Occupies 2 stations | Occupies 3 stations | Occupies 4 stations |
|---|---|---|---|---|
| single | 0 | 0 | 0 | 0 |
| double | 70×Number of stations | 80×Number of stations | 90×Number of stations | 100×Number of stations |
| quadruple | 90×Number of stations | 110×Number of stations | 130×Number of stations | 150×Number of stations |
| octuple | 110×Number of stations | 160×Number of stations | 210×Number of stations | 260×Number of stations |

F: Return processing time {only when there is a faulty station (including error invalid and temporary error invalid stations)}
Number of faulty stations × 118 × BT × (1 + number of retries)

TR: Transient processing time (only when a transient request is made)
- When there is a transient request from the master station
  180 × BT
- When there is a transient request from the local station
  40.8 × BT × number of transient transmission stations

(Example) Using the following system configuration when the transmission rate is 10 Mbps (assuming that there is no faulty station or transient transmission.)




∗1: (occupies 1 station) ∗2: (occupies 2 stations) quadruple ∗3: (occupies 4 stations) single

BT = 0.8 ST = 2300 EX = 50 + 110 × 1 = 160
NI = 12 → 16 1) 800 + (12 × 15) = 980
NW = 11 → 16 2) 900 + (3 × 50) = 1050
N = 5 3) 1200 + (11 × 100) = 2300
ni = 12 A = 12, B = 3, C = 11
nw = 10
LS = 0.8 {27 + (16 × 4.8) + (16 × 9.6) + (5 × 30) + (12 × 4.8) + (10 × 9.6)} + 2300 + 160
= 2908.8 [μ s]
= 2.91 [ms]

(2) For remote I/O net mode

LS = BT {27 + (NI × 4.8) + (N × 30) + (ni × 4.8)} + ST + F [μs]

BT: Constant (transmission rate)

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BT | 51.2 | 12.8 | 3.2 | 1.6 | 0.8 |

NI: NI: Final station number (must be a multiple of 8)

| Final station number | 1 to 8 | 9 to 16 | 17 to 24 | 25 to 32 | 33 to 40 | 41 to 48 | 49 to 56 | 57 to 64 |
|---|---|---|---|---|---|---|---|---|
| NI | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 |

N: Number of connected modules

ni: Total number of occupied stations

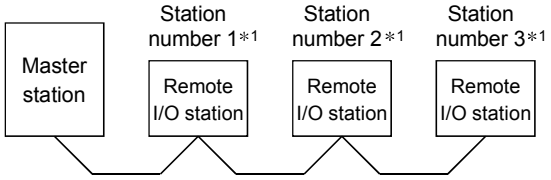
ST: Constant

250 + (ni × 10)

F: Return processing time {only when there is a faulty station (including error invalid and temporary error invalid stations)}

Number of faulty stations × 118 × BT × (1 + number of retries)

(Example) Using the following system configuration when the transmission rate is 10 Mbps (assuming that there is no faulty station)




*1: (occupies 1 station)

BT = 0.8

NI = 3 → 8

N = 3

ni = 3

ST = 200 + (ni × 10)

= 200 + (3 × 10)

= 230

LS = 0.8 {27 + (8 × 4.8) + (3 × 30) + (3 × 4.8)} + 230

= 365.84 [μs]

= 0.37 [ms]

## 5.2 Transmission Delay Time

This section explains the transmission delay time (the time until data is transmitted).

### 5.2.1 Master station ↔ remote I/O station

(1) Master station (RX) ← remote I/O station (input)

This indicates the time from the moment the signal is input to the remote I/O station until the CPU device turns ON (OFF).

[Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 1 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS : Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

SM + LS × 1 + Remote I/O station response time [ms]

= 20 + 3 × 1 + 1.5

= 24.5 [ms]

(b) Synchronous mode

(SM × n) × 1 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM) value when fractions following the decimal point are rounded up to the next whole number.

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

(SM × n) × 1 + Remote I/O station response time [ms]

= (20 × 1) × 1 + 1.5

= 21.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

SM + LS × 2 + Remote I/O station response time [ms]

= 20 + 3 × 2 + 1.5

= 27.5 [ms]

(b) Synchronous mode

(SM × n) × 2 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM) value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

(SM × n) × 2 + Remote I/O station response time [ms]

= (20 × 1) × 2 + 1.5

= 41.5 [ms]

### (2) Master station (RY) → remote I/O station (output)

This indicates the time from the moment the CPU device turns ON (OFF) until the remote I/O station output turns ON (OFF).

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 1 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

SM + LS × 1 + Remote I/O station response time [ms]

= 20 + 3 × 1 + 1.5

= 24.5 [ms]

(b) Synchronous mode

SM × n + LS × 2 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

SM × n + LS + Remote I/O station response time [ms]

= 20 × 1 + 3 + 1.5

= 24.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

SM + LS × 2 + Remote I/O station response time [ms]

= 20 + 3 × 2 + 1.5

= 27.5 [ms]

(b) Synchronous mode

SM × n + LS × 2 + Remote I/O station response time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote I/O station response time is 1.5 ms.

SM × n + LS × 2 + Remote I/O station response time [ms]

= 20 × 1 + 3 × 2 + 1.5

= 27.5 [ms]

### 5.2.2 Master station ↔ remote device station (Ver. 1 compatible slave station)

#### (1) Master station (RX) ← remote device station (RX)

This indicates the time from the moment the signal is input to the remote device station until the CPU device turns ON (OFF).

[Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 1 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM + LS × 1 + Remote device station processing time [ms]

= 20 + 3 × 1 + 1.5

= 24.5 [ms]

(b) Synchronous mode

(SM × n) × 1 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.
(SM × n) × 1 + Remote device station processing time [ms]
= (20 × 1) × 1 + 1.5
= 21.5 [ms]

[Maximum value]

(a) Asynchronous mode
SM + LS × 2 + Remote device station processing time [ms]
SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.
SM + LS × 2 + Remote device station response time [ms]
= 20 + 3 × 2 + 1.5
= 27.5 [ms]

(b) Synchronous mode
(SM × n) × 2 + Remote device station processing time [ms]
SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.
(SM × n) × 2 + Remote device station processing time [ms]
= (20 × 1) × 2 + 1.5
= 41.5 [ms]

### (2) Master station (RY) → remote device station (RY)

This indicates the time from the moment the CPU device turns ON (OFF) until the remote device station output turns ON (OFF).

#### [Expression]

[Normal value]

(a) Asynchronous mode
SM + LS × 1 + Remote device station processing time [ms]
SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.
SM + LS × 1 + Remote device station processing time [ms]
= 20 + 3 × 1 + 1.5
= 24.5 [ms]

(b) Synchronous mode

SM × n + LS + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM × n + LS + Remote device station processing time [ms]

= 20 × 1 + 3 + 1.5

= 24.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM + LS × 2 + Remote device station processing time [ms]

= 20 + 3 × 2 + 1.5

= 27.5 [ms]

(b) Synchronous mode

SM × n + LS × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM × n + LS × 2 + Remote device station processing time [ms]

= 20 × 1 + 3 × 2 + 1.5

= 27.5 [ms]

### (3) Master station (RWr) ← remote device station (RWr)

This indicates the time from the moment the signal is input to the remote device station until the data for the CPU device is changed.

[Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 1 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM + LS × 1 + Remote device station processing time [ms]

= 20 + 3 × 1 + 1.5

= 24.5 [ms]

(b) Synchronous mode

(SM × n) × 1 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

(SM × n) × 1 + Remote device station processing time [ms]

= (20 × 1) × 1 + 1.5

= 21.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM + LS × 2 + Remote device station processing time [ms]

= 20 + 3 × 2 + 1.5

= 27.5 [ms]

(b) Synchronous mode

(SM × n) × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

(SM × n) × 2 + Remote device station processing time [ms]

= (20 × 1) × 2 + 1.5

= 41.5 [ms]

### (4) Master station (RWw) → remote device station (RWw)

This indicates the time from the moment data is set to the CPU device until the data for the remote device station is changed.

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 1 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM + LS × 1 + Remote device station processing time [ms]

= 20 + 3 × 1 + 1.5

= 24.5 [ms]

(b) Synchronous mode

SM × n + LS + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM × n + LS + Remote device station processing time [ms]

= 20 × 1 + 3 + 1.5

= 24.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM + LS × 2 + Remote device station processing time [ms]

= 20 + 3 × 2 + 1.5

= 27.5 [ms]

(b) Synchronous mode

SM × n + LS × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms and the remote device station processing time is 1.5 ms.

SM × n + LS × 2 + Remote device station processing time [ms]

= 20 × 1 + 3 × 2 + 1.5

= 27.5 [ms]

### 5.2.3 Master station ↔ remote device station (Ver. 2 compatible slave station)

#### (1) Master station (RX) ← remote device station (RX)

This indicates the time from the moment the signal is input to the remote device station until the CPU device turns ON (OFF).

[Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 1 × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × 1× m + Remote device station processing time [ms]

= 20 + 3 × 1× 3 + 1.5

= 30.5 [ms]

(b) Synchronous mode

(SM × n) × 1 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

(SM × n) × 1 + Remote device station processing time [ms]

= (20 × 1) × 1 + 1.5

= 21.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × 2 × m + Remote device station response time [ms]

= 20 + 3 × 2 × 3 + 1.5

= 39.5 [ms]

(b) Synchronous mode

(SM × n) × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

(SM × n) × 2 + Remote device station processing time [ms]

= (20 × 1) × 2 + 1.5

= 41.5 [ms]

### (2) Master station (RY) → remote device station (RY)

This indicates the time from the moment the CPU device turns ON (OFF) until the remote device station output turns ON (OFF).

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × (1 × m + 1) + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × (1 × m + 1) + Remote device station processing time [ms]

= 20 + 3 × (1 × 3 + 1) + 1.5

= 33.5 [ms]

(b) Synchronous mode

SM × n + LS × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m /SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM × n + LS × m + Remote device station processing time [ms]

= 20 × 1 + 3 × 3 + 1.5

= 30.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × (2 × m + 1) + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × (2 × m + 1) + Remote device station processing time [ms]

= 20 + 3 × (2 × 3 + 1) + 1.5

= 42.5 [ms]

(b) Synchronous mode

SM × n + LS × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM × n + LS × m + Remote device station processing time [ms]

= 20 × 1 + 3 × 3 + 1.5

= 30.5 [ms]

### (3) Master station (RWr) ← remote device station (RWr)

This indicates the time from the moment the signal is input to the remote device station until the data for the CPU device is changed.

[Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 1 × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × 1 × m + Remote device station processing time [ms]

= 20 + 3 × 1 × 3 + 1.5

= 30.5 [ms]

(b) Synchronous mode

(SM × n) × 1 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

(SM × n) × 1 + Remote device station processing time [ms]

= (20 × 1) × 1 + 1.5

= 21.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × 2 × m + Remote device station processing time [ms]

= 20 + 3 × 2 × 3 + 1.5

= 39.5 [ms]

(b) Synchronous mode

(SM × n) × 2 + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

(SM × n) × 2 + Remote device station processing time [ms]

= (20 × 1) × 2 + 1.5

= 41.5 [ms]

### (4) Master station (RWw) → remote device station (RWw)

This indicates the time from the moment data is set to the CPU device until the data for the remote device station is changed.

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × (1 × m + 1) + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × (1 × m + 1) + Remote device station processing time [ms]

= 20 + 3 × (1 × 3 + 1) + 1.5

= 33.5 [ms]

(b) Synchronous mode

SM × n + LS × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM × n + LS × m + Remote device station processing time [ms]

= 20 × 1 + 3 × 3 + 1.5

= 30.5 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × (2 × m + 1) + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM + LS × (2 × m + 1) + Remote device station processing time [ms]

= 20 + 3 × (2 × 3 + 1) + 1.5

= 42.5 [ms]

(b) Synchronous mode

SM × n + LS × m + Remote device station processing time [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number

m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the remote device station processing time is 1.5 ms.

SM × n + LS × m + Remote device station processing time [ms]

= 20 × 1 + 3 × 3 + 1.5

= 30.5 [ms]


5 - 19

### 5.2.4 Master station ↔ local station (Ver. 1 compatible slave station)

#### (1) Master station (RX) ← local station (RY)

This indicates the time from the moment the local station CPU device turns ON (OFF) until the master station CPU device turns ON (OFF).

[Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 2 + SL [ms]
= 20 + 3 × 2 + 10
= 36 [ms]

(b) Synchronous mode

(SM × n) × 2 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

(SM × n) × 2 + SL [ms]
= (20 × 1) × 2 + 10
= 50 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 3 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 3 + SL [ms]
= 20 + 3 × 3 + 10
= 39 [ms]

(b) Synchronous mode

(SM × n) × 3 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

(SM × n) × 3 + SL [ms]
= (20 × 1) × 3 + 10
= 70 [ms]

### (2) Master station (RY) → local station (RX)

This indicates the time from the moment the master station CPU device turns ON (OFF) until the local station CPU device turns ON (OFF).

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 2 + SL [ms]
= 20 + 3 × 2 + 10
= 36 [ms]

(b) Synchronous mode

SM × n + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM × n + LS × 2 + SL [ms]
= 20 × 1 + 3 × 2 + 10
= 36 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 2 + SL [ms]
= 20 + 3 × 2 + 10
= 36 [ms]

(b) Synchronous mode

SM × n + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM × n + LS × 2 + SL [ms]
= 20 × 1 + 3 × 2 + 10
= 36 [ms]

### (3) Master station (RWr) ← local station (RWw)

This indicates the time from the moment data is set to the local station CPU device until the data is stored in the master station CPU device.

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 2 + SL [ms]
= 20 + 3 × 2 + 10
= 36 [ms]

(b) Synchronous mode

(SM × n) × 2 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

(SM × n) × 2 + SL [ms]
= (20 × 1) × 2 + 10
= 50 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 3 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 3 + SL [ms]
= 20 + 3 × 3 + 10
= 39 [ms]

(b) Synchronous mode

(SM × n) × 3 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

(SM × n) × 3 + SL [ms]
= (20 × 1) × 3 + 10
= 70 [ms]

### (4) Master station (RWw) → local station (RWr)

This indicates the time from the moment data is set to the master station CPU device until the data is stored in the local station CPU device.

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 2 + SL [ms]
= 20 + 3 × 2 + 10
= 36 [ms]

(b) Synchronous mode

SM × n + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM × n + LS × 2 + SL [ms]
= 20 × 1 + 3 × 2 + 10
= 36 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × 2 + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM + LS × 2 + SL [ms]
= 20 + 3 × 2 + 10
= 36 [ms]

(b) Synchronous mode

SM × n + LS × 2 + SL [ms]

SM: Master station sequence program scan time

LS: Link scan time (see Section 5.1)

SL: Local station sequence program scan time

n: (LS/SM)value when fractions following the decimal point are rounded up to the next whole number

(Example) When the master station sequence scan time is 20 ms, the link scan time is 3 ms and the local station sequence scan time is 10 ms.

SM × n + LS × 2 + SL [ms]

= 20 × 1 + 3 × 2 + 10

= 36 [ms]

### 5.2.5 Master station ↔ local station (Ver. 2 compatible slave station)

#### (1) Master station (RX) ← local station (RY)

This indicates the time from the moment the local station CPU device turns ON (OFF) until the master station CPU device turns ON (OFF).

[Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × (1 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (1 × m + 1) + SL [ms]
= 20 + 3 × (1 × 3 + 1) + 10
= 42 [ms]

(b) Synchronous mode

(SM × n) × 1 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 1 + SL [ms]
= (20 × 1) × 1 + 10
= 30 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × (2 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (2 × m + 1) + SL [ms]
= 20 + 3 × (2 × 3 + 1) + 10
= 51 [ms]

(b) Synchronous mode

(SM × n) × 2 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 2 + SL [ms]
= (20 × 1) × 2 + 10
= 50 [ms]

### (2) Master station (RY) → local station (RX)

This indicates the time from the moment the master station CPU device turns ON (OFF) until the local station CPU device turns ON (OFF).

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × (1 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (1 × m + 1) + SL [ms]
= 20 + 3 × (1 × 3 + 1) + 10
= 42 [ms]

(b) Synchronous mode

(SM × n) × 1 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 1 + SL [ms]
= (20 × 1) × 1 + 10
= 30 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × (2 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (2 × m + 1) + SL [ms]
= 20 + 3 × (2 × 3 + 1) + 10
= 51 [ms]

(b) Synchronous mode

(SM × n) × 2 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 2 + SL [ms]
= (20 × 1) × 2 + 10
= 50 [ms]

### (3) Master station (RWr) ← local station (RWw)

This indicates the time from the moment data is set to the local station CPU device until the data is stored in the master station CPU device.

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × (1 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (1 × m + 1) + SL [ms]
= 20 + 3 × (1 × 3 + 1) + 10
= 42 [ms]

(b) Synchronous mode

(SM × n) × 1 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 1 + SL [ms]
= (20 × 1) × 1 + 10
= 30 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × (2 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (2 × m + 1) + SL [ms]
= 20 + 3 × (2 × 3 + 1) + 10
= 51 [ms]

(b) Synchronous mode

(SM × n) × 2 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 2 + SL [ms]
= (20 × 1) × 2 + 10
= 50 [ms]

### (4) Master station (RWw) → local station (RWr)

This indicates the time from the moment data is set to the master station CPU device until the data is stored in the local station CPU device.

#### [Expression]

[Normal value]

(a) Asynchronous mode

SM + LS × (1 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (1 × m + 1) + SL [ms]
= 20 + 3 × (1 × 3 + 1) + 10
= 42 [ms]

(b) Synchronous mode

(SM × n) × 1 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 1 + SL [ms]
= (20 × 1) × 1 + 10
= 30 [ms]

[Maximum value]

(a) Asynchronous mode

SM + LS × (2 × m + 1) + SL [ms]

SM: Master station sequence program scan time
LS: Link scan time (see Section 5.1)
SL: Local station sequence program scan time
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

SM + LS × (2 × m + 1) + SL [ms]
= 20 + 3 × (2 × 3 + 1) + 10
= 51 [ms]

(b) Synchronous mode

(SM × n) × 2 + SL [ms]

SM: Master station sequence program scan time
SL: Local station sequence program scan time
LS: Link scan time (see Section 5.1)
n: (LS × m/SM)value when fractions following the decimal point are rounded up to the next whole number
m: Constant (expanded cyclic setting)

| Expanded cyclic setting | single | double | quadruple | octuple |
|---|---|---|---|---|
| m | 1 | 3 | 7 | 15 |

(Example) When the sequence scan time for the master station is 20 ms, the link scan time is 3 ms, the expanded cyclic setting is "double", and the sequence scan time for the local station processing time is 10 ms.

(SM × n) × 2 + SL [ms]
= (20 × 1) × 2 + 10
= 50 [ms]

### 5.2.6 Master station ↔ intelligent device station

The transmission delay time between the master station and an intelligent device station varies by the type of intelligent device station used.
See the User's Manual for the intelligent device module to be used.

## 5.3 Processing Time for Dedicated Instructions

This indicates the dedicated instruction processing time (the time from the moment an instruction is issued until a response is received).

### 5.3.1 Master station ↔ local station

#### (1) Master station → local station

This indicates the time from the moment an instruction is issued by the master station until a response from the local station is received.

[Expression]

[Maximum value]

(a) RIRD instruction

OT + LS × [BC + {(read points + 16)/16} *1 × 1.067] + SL [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

SL: Local station sequence program scan time
(0 when reading buffer memory in the CC-Link)

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5 ms and the read points are 20 words (buffer memory in the CC-Link).

OT + LS × [BC + {(read points + 16)/16} *1 × 1.067] [ms]
= 0.5 + 5 × [12 + {(20 + 16)/16} *1 × 1.067]
= 0.5 + 5 × [12 + {3 × 1.067}]
= 76.505
= 76.5 [ms]

(b) RIWT instruction

OT + LS × [BC + {(write points + 16)/72} *1 × 1.13] + SL [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

SL: Local station sequence program scan time
(0 when writing buffer memory in the CC-Link)

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5 ms and the write points are 20 words (buffer memory in the CC-Link).

OT + LS × [BC + {(write points + 16)/72} *1 × 1.13] [ms]
= 0.5 + 5 × [12 + {(20 + 16)/72} *1 × 1.13]
= 0.5 + 5 × [12 + {1 × 1.13}]
= 66.15
= 66.2 [ms]

### (2) Local station → master station

This indicates the time from the moment an instruction is issued by the local station until a response from the master station is received.

#### [Expression]

[Maximum value]

(a) RIRD instruction

OT + LS × [BC + {(read points + 16)/72} *1 × 1.13] + SM [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

SM: Master station sequence program scan time
(0 when reading buffer memory in the CC-Link)

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5 ms and the read points are 20 words (buffer memory in the CC-Link).

OT + LS × [BC + {(read points + 16)/72} *1 × 1.13] [ms]
= 0.5 + 5 × [12 + {(20 + 16)/72} *1 × 1.13]
= 0.5 + 5 × [12 + {1 × 1.13}]
= 66.15
= 66.2 [ms]

(b) RIWT instruction

OT + LS × [BC + {(write points + 16)/16} *1 × 1.067] + SM [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

SM: Master station sequence program scan time
(0 when writing buffer memory in the CC-Link)

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5ms and the write points are 20 words (buffer memory in the CC-Lnik).

OT + LS × [BC + {(write points + 16)/16} ＊1 × 1.067] [ms]

= 0.5 + 5 × [12 + {(20 + 16)/16} ＊1 × 1.067]

= 0.5 + 5 × [12 + {3 × 1.067}]

= 76.505

= 76.5 [ms]


5 - 37

### 5.3.2 Local station ↔ local station

#### (1) Local station → local station

This indicates the time from the moment an instruction is executed by one local station until a response from another local station is received.

[Expression]

[Maximum value]

(a) RIRD instruction

OT + LS × [BC + {(read points + 16)/16} *1 × 1.067] + SL [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

SL: Target station sequence program scan time
(0 when reading buffer memory in the CC-Link)

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5 ms and the read points are 20 words (buffer memory in the CC-Link).

OT + LS × [BC + {(read points + 16)/16} *1 × 1.067] [ms]
= 0.5 + 5 × [12 + {(20 + 16)/16} *1 × 1.067]
= 0.5 + 5 × [12 + {3 × 1.067}]
= 76.505
= 76.5 [ms]

(b) RIWT instruction

OT + LS × [BC + {(write points + 16)/16} *1 × 1.067] + SL [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

SL: Target station sequence program scan time
(0 when writing buffer memory in the CC-Link)

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5 ms and the write points are 20 words (buffer memory in the CC-Link).

OT + LS × [BC + {(write points + 16)/16} *1 × 1.067] [ms]
= 0.5 + 5 × [12 + {(20 + 16)/16} *1 × 1.067]
= 0.5 + 5 × [12 + {3 × 1.067}]
= 76.505
= 76.5 [ms]

### 5.3.3 Master station ↔ intelligent device station

#### (1) Master station → intelligent device station

This indicates the time from the moment an instruction is issued by the master station and a response from an intelligent device station is received.

[Expression]

[Maximum value]

(a) RIRD instruction

OT + LS × [BC + {(read points + 16)/16} *1 × 1.067] [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5 ms and the read points are 20 words.

OT + LS × [BC + {(read points + 16)/16} *1 × 1.067] [ms]
= 0.5 + 5 × [12 + {(20 + 16)/16} *1 × 1.067]
= 0.5 + 5 × [12 + {3 × 1.067}]
= 76.505
= 76.5 [ms]

(b) RIWT instruction

OT + LS × [BC + {(write points + 16)/72} *1 × 1.13] [ms]

OT: QCPU (Q mode) dedicated instruction processing time
QnCPU : 1 [ms]
QnHCPU : 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

| Transmission rate | 156 kbps | 625 kbps | 2.5 Mbps | 5 Mbps | 10 Mbps |
|---|---|---|---|---|---|
| BC | 6 | 7 | 9 | 11 | 12 |

*1: Round up below the decimal point

(Example) When the PLC CPU type is Q06HCPU, the transmission rate is 10 Mbps, the link scan time is 5 ms and the write points are 20 words.

OT + LS × [BC + {(write points + 16)/72} *1 × 1.13] [ms]
= 0.5 + 5 × [12 + {(20 + 16)/72} *1 × 1.13]
= 0.5 + 5 × [12 + {1 × 1.13}]
= 66.15
= 66.2 [ms]

## 5.4 Link Refresh Time

This section indicates link refresh time (increase of END processing time at the PLC CPU).

### 5.4.1 Master station/local station

This section indicates the link refresh time of the master/local station.

#### (1) Remote net ver. 1 mode, remote net ver. 2 mode

[Expression]

$$KM1 + KM2 \times (\frac{RX + RY + SB}{16} + RWw + RWr + SW) + \alpha E \text{ [ms]}$$

$$\alpha E = KM3 \times (\frac{RX + RY + SB}{16} + RWw + RWr + SW)$$

RX : Points of the remote input (RX) refreshed by the master/local station
RY : Points of the remote output (RY) refreshed by the master/local station
RWw : Points of the remote register (RWw) refreshed by the master/local station
RWr : Points of the remote register (RWr) refreshed by the master/local station
SB : Points of the link special relay (SB) refreshed by the master/local station
SW : Points of the link special register (SW) refreshed by the master/local station
αE : File register (R, ZR) transfer time on memory card (only when file register is used)

KM1 : Constant

1) Master station

| CPU type \ Constant | KM1 |
|---|---|
| Q00JCPU | 0.83 |
| Q00CPU | 0.68 |
| Q01CPU | 0.66 |
| Q02CPU | 0.40 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU | 0.16 |

2) Local station

| CPU type \ Constant | KM1 |
|---|---|
| Q00JCPU | 1.05 |
| Q00CPU | 0.86 |
| Q01CPU | 0.79 |
| Q02CPU | 0.63 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU | 0.23 |

KM2, KM3 : Constant

1) When QJ61BT11N is mounted on main base unit

| CPU type \ Constant | KM2 ($\times 10^{-3}$) | KM3 ($\times 10^{-3}$) |
|---|---|---|
| Q00JCPU | 0.91 | – |
| Q00CPU | 0.83 | – |
| Q01CPU | 0.79 | – |
| Q02CPU | 0.48 | 0.32 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PHCPU, Q25PHCPU | 0.43 | 0.14 |

2) When QJ61BT11N is mounted on extension base unit

| CPU type \ Constant | KM2 ($\times 10^{-3}$) | KM3 ($\times 10^{-3}$) |
|---|---|---|
| Q00JCPU | 1.62 | – |
| Q00CPU | 1.57 | – |
| Q01CPU | 1.55 | – |
| Q02CPU | 1.02 | 0.08 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PHCPU, Q25PHCPU | 0.98 | 0.06 |

(Example)

When the PLC CPU type is the Q06HCPU, the QJ61BT11N is mounted on the main base and used as the master station, and 2048 points of RX, 2048 points of RY, 256 points of RWw, 256 points of RWr, 512 points of SB and 512 points of SW are refreshed besides the file register.

$$KM1 + KM2 \times \left(\frac{RX + RY + SB}{16} + RWw + RWr + SW\right)$$

$$= 0.16 + 0.00043 \times \left(\frac{2048 + 2048 + 512}{16} + 256 + 256 + 512\right)$$

$$= 0.16 + 0.00043 \times 1312$$

$$= 0.72416$$

$$= 0.72 \text{ [ms]}$$

(2) Remote net additional mode

[Expression]

$$KM1 + KM2 \times \left(\frac{RX + RX2 + RY + RY2 + SB}{16} + RWw + RWw2 + RWr + RWr2 + SW\right) + \alpha E \text{ [ms]}$$

$$\alpha E = KM3 \times \left(\frac{RX + RX2 + RY + RY2 + SB}{16} + RWw + RWw2 + RWr + RWr2 + SW\right)$$

RX : Points of the remote input (RX) refreshed by the master/local station
RX2 : Points of the ver. 2 remote input (RX) refreshed by the master/local station
RY : Points of the remote output (RY) refreshed by the master/local station
RY2 : Points of the ver. 2 remote output (RY) refreshed by the master/local station
RWw : Points of the remote register (RWw) refreshed by the master/local station
RWw2 : Points of the ver. 2 remote register (RWw) refreshed by the master/local station
RWr : Points of the remote register (RWr) refreshed by the master/local station
RWr2 : Points of the ver. 2 remote register (RWr) refreshed by the master/local station
SB : Points of the link special relay (SB) refreshed by the master/local station
SW : Points of the link special register (SW) refreshed by the master/local station
αE : File register (R, ZR) transfer time on memory card (only when file register is used)

KM1 : Constant

1) Master station

| Constant / CPU type | KM1 |
|---|---|
| Q00JCPU | 1.05 |
| Q00CPU | 0.86 |
| Q01CPU | 0.80 |
| Q02CPU | 0.57 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU | 0.22 |

2) Local station

| Constant / CPU type | KM1 |
|---|---|
| Q00JCPU | 1.27 |
| Q00CPU | 1.04 |
| Q01CPU | 0.93 |
| Q02CPU | 0.76 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU | 0.32 |

KM2, KM3 : Constant

1) When QJ61BT11N is mounted on main base unit

| Constant / CPU type | KM2 ($\times 10^{-3}$) | KM3 ($\times 10^{-3}$) |
|---|---|---|
| Q00JCPU | 0.91 | — |
| Q00CPU | 0.83 | — |
| Q01CPU | 0.79 | — |
| Q02CPU | 0.48 | 0.32 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU | 0.43 | 0.14 |

2) When QJ61BT11N is mounted on extension base unit

| Constant / CPU type | KM2 ($\times 10^{-3}$) | KM3 ($\times 10^{-3}$) |
|---|---|---|
| Q00JCPU | 1.62 | — |
| Q00CPU | 1.57 | — |
| Q01CPU | 1.55 | — |
| Q02CPU | 1.02 | 0.08 |
| Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU | 0.98 | 0.06 |

(Example)

When the PLC CPU type is the Q06HCPU, the QJ61BT11N is mounted on the main base and used as the master station, and 1024 points of RX, 896 points of RX2, 1024 points of RY, 896 points of RY2, 128 points of RWw, 128 points of RWw2, 128 points of RWr, 128 points of RWr2, 512 points of SB and 512 points of SW are refreshed besides the file register.

$$KM1 + KM2 \times \left(\frac{RX + RX2 + RY + RY2 + SB}{16} + RWw + RWw2 + RWr + RWr2 + SW\right)$$

$$= 0.22 + 0.00043 \times \left(\frac{1024 + 896 + 1024 + 896 + 512}{16} + 128 + 128 + 128 + 128 + 512\right)$$

$$= 0.22 + 0.00043 \times 1296$$

$$= 0.77728$$

$$= 0.78\ [ms]$$

## 5.5 Station Status at Error Occurrence

This section explains the status of each station at error occurrence.

### 5.5.1 Status of the master station, standby master station (when the master station is operating) and remote I/O station at error occurrence

Table 5.1 lists the operation of the master station, standby master station (when the master station is operating) and remote I/O station upon the occurrence of an error.

Table 5.1 The status of the master station, standby master station (when the master station is operating) and remote I/O station at error occurrence

| Data link status | | | Master station, standby master station (when the master station is operating) | | | | Remote I/O station | |
|---|---|---|---|---|---|---|---|---|
| | | | Remote input (RX) | Remote output (RY) | Remote register (RWw) | Remote register (RWr) | Input | Output |
| When data link is stopped due to an error generated by the master station PLC CPU (data link continue) | | | Continue | *1 | Continue | Hold | Continue | *1 |
| When data link is stopped due to an error generated by the local station PLC CPU (data link continue) | | | *2 | Continue | Continue | Continue | Continue | Continue |
| When data link for the entire system is stopped | The GX Developer data link faulty station is set (master station setting) | Clear | Clear | Undefined | Undefined | Hold | By external signals | All points OFF |
| | | Hold | Hold | | | | | |
| When a communication error (power off, etc.) occurs in a remote I/O station | The GX Developer data link faulty station is set (master station setting) | Clear | Clears the receive area from the remote I/O station having a communication error | Continue | Continues operation of areas other than the remote I/O station | Continues operation of areas other than the remote I/O station | By external signals | All points OFF |
| | | Hold | Retains the receive area from the remote I/O station with a communication error | | | | | |
| When a communication error (power off, etc.) occurs in a remote device station | The GX Developer data link faulty station is set (master station setting) | Clear | Clears the receive area from the remote device station with a communication error | Continue | Continue | Retains the receive area from the remote device station with a communication error | Continue (Not affected by the communication status of the remote device station) | Continue (Not affected by the communication status of the remote device station) |
| | | Hold | Retains the receive area from the remote device station with a communication error. | | | | | |
| When a communication error (power off, etc.) occurs in a local station | The GX Developer data link faulty station is set (master station setting) | Clear | Clears the receive area from the local station with a communication error | Continue | Continue | Retains the receive area from the local station with a communication error | Continue (Not affected by the communication status of the local station) | Continue (Not affected by the communication status of the local station) |
| | | Hold | Retains the receive area from the local station with a communication error | | | | | |

*1: If parameter setting has been made using the dedicated instructions, the data is held. If parameter setting has been made using GX Developer, the data is cleared when the RY refresh device is set to Y, the data is cleared or held when the RY refresh device is set to other than Y. (See Section 4.3.5.)

*2: When the RY refresh device is set to "Y" for the local station that has stopped, only the receive area is cleared from the stopped local station ; the receive area is retained or cleared when the RY refresh device is set to other than Y. (See Section 4.3.5.) Operation continues for the receive areas from other stations.

### 5.5.2 Status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence

Table 5.2 lists the status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence.

Table 5.2 The status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence

| Data link status | | | Remote device station, intelligent device station | | | | Local station, standby master station (when local station is operating) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Remote input (RX) | Remote output (RY) | Remote register (RWw) | Remote register (RWr) | Remote input (RX) | Remote output (RY) | Remote register (RWw) | Remote register (RWr) |
| When data link is stopped due to an error generated by the master station PLC CPU (data link continue) | | | Continue | *1 | Continue | Continue | Clear | Continue | Continue | Continue |
| When data link is stopped due to an error generated by the local station PLC CPU (data link continue) | | | Continue | Continue | Continue | Continue | Continue | *3 | Continue | Continue |
| When data link for the entire system is stopped | The GX Developer data link faulty station is set (local station setting) | Clear | Undefined | All points OFF | Undefined | Undefined | Clear | Clears the receive areas from other stations | Retains the receive area from other stations | Hold |
| | | Hold | | | | | Hold | Retains the receive areas from other stations | | |
| When a communication error (power off, etc.) occurs in a remote I/O station | The GX Developer data link faulty station is set (local station setting) | Clear | Continue | Continue | Continue | Continue | Continue | Clears the receive area from a remote I/O station with a communication error | Continue | Continue |
| | | Hold | | | | | | Retains the receive area from a remote I/O station with a communication error | | |
| When a communication error (power off, etc.) occurs in a remote device station | The GX Developer data link faulty station is set (local station setting) | Clear | Undefined | Undefined | Undefined | Undefined | Continue | Clears the receive area from a remote device station with a communication error | Retains the receive area from a remote device station with a communica-tion error | Continue |
| | | Hold | | | | | | Retains the receive area from a remote device station with a communication error | | |
| When a communication error (power off, etc.) occurs in a local station | The GX Developer data link faulty station is set (local station setting) | Clear | Continue | Continue | Continue | Continue | Continue | Clears the receive area from a local station with a communication error | Retains the receive area from a local station with a communica-tion error | Continue |
| | | Hold | | | | | | Retains the receive area from a local station with a communication error | | |

*1: If parameter setting has been made using the dedicated instructions, the data is held. If parameter setting has been made using GX Developer, the data is clear when the RY refresh device is set to Y, the data is cleared or held when the RY refresh device is set to other than Y. (See Section 4.3.5.)

*2: When the RY refresh device is set to "Y" for the local station that has stopped, only the receive area is cleared from the stopped local station; the receive area is retained or cleared when the RY refresh device is set to other than Y. (See Section 4.3.5.) Operation continues for the receive areas from other stations.

# 6 PARAMETER SETTINGS

This chapter explains the parameter settings that are required to perform data link with the CC-Link.

## 6.1 Procedure from Parameter Settings to Data Link Startup

The following explains the procedure from setting the parameters to starting the data link.

### 6.1.1 CPU parameter area and master module parameter memory

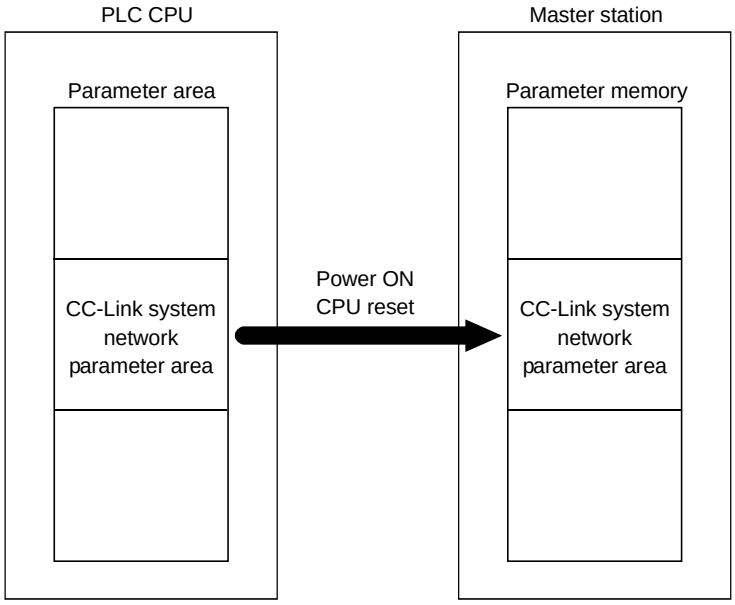
The following explains the relationship between the CPU parameter area and the master station's parameter memory.

(1) CPU parameter area

This area is used to set the basic values for controlling the PLC system and the network parameters that control the CC-Link system.

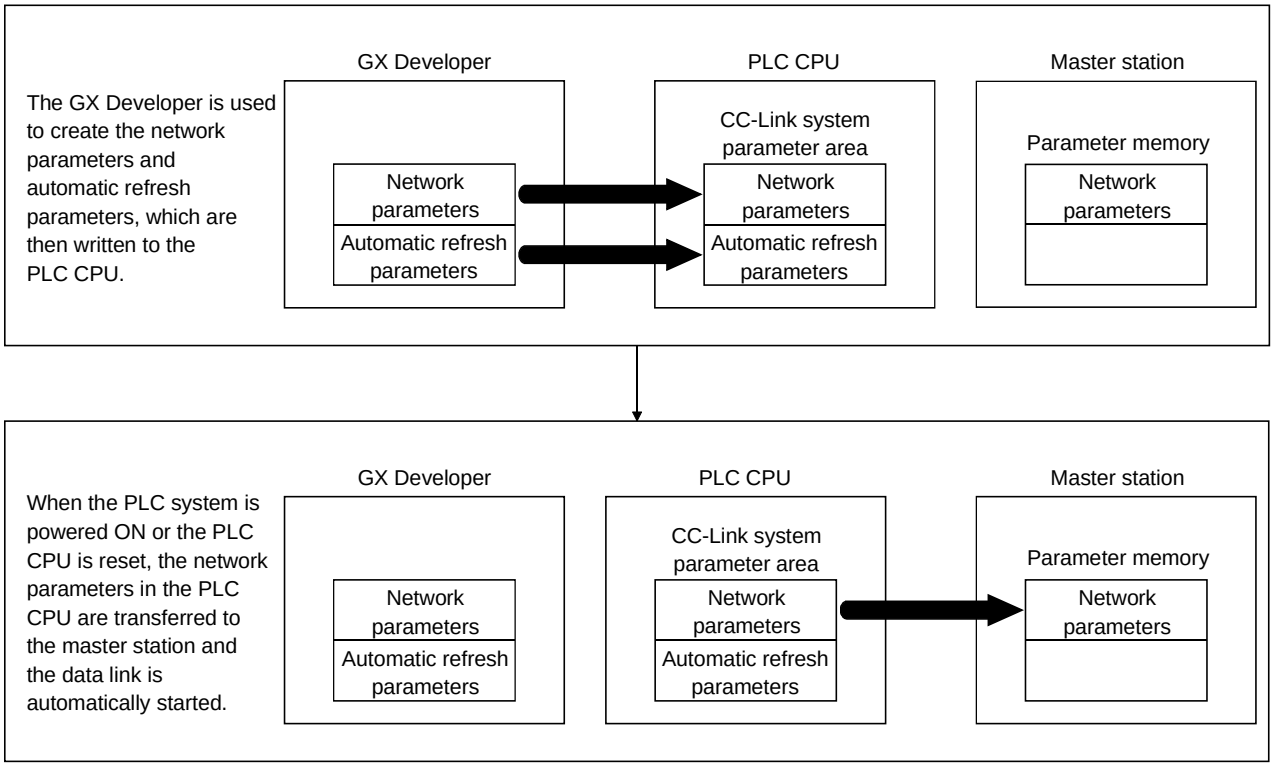
(2) Master station parameter memory

This area stores the network parameters for the CC-Link system.
When the module is powered off or the PLC CPU is reset, the network parameters are erased.



## 6.1.2 Procedure from parameter settings to data link startup with GX Developer

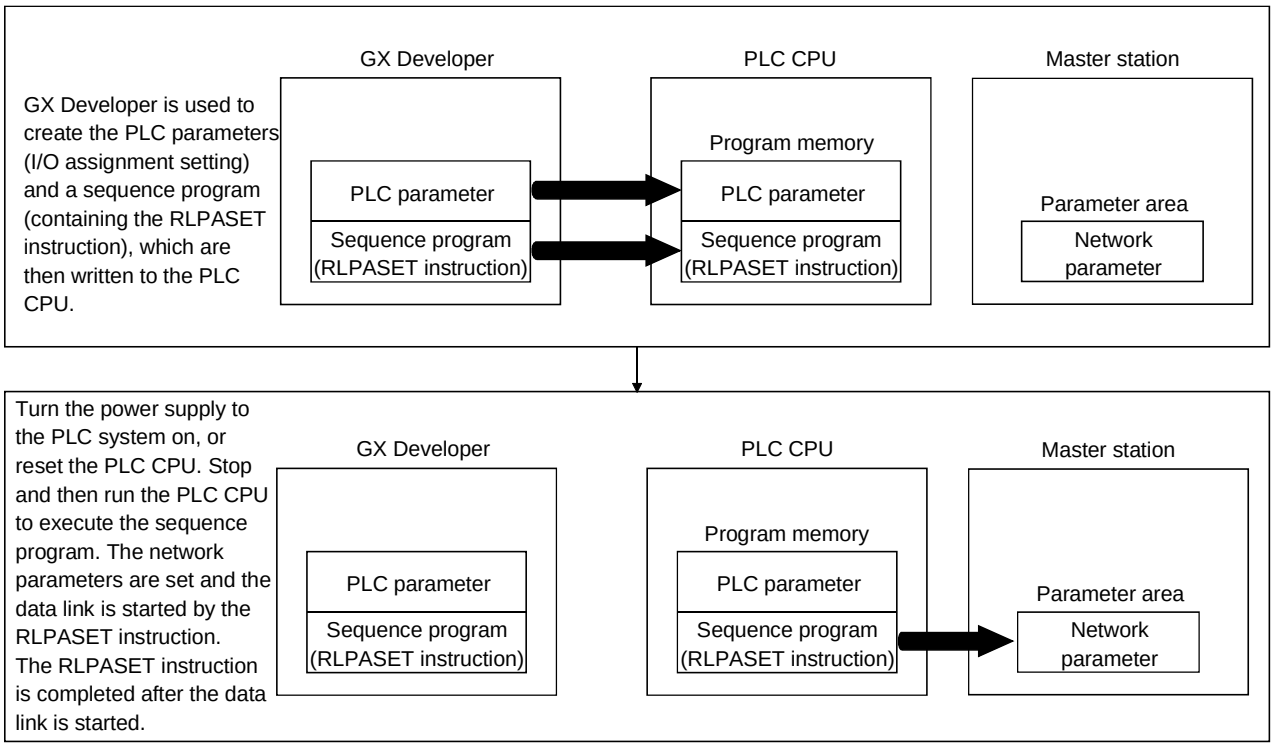
Follow the procedure below from parameter settings to data link startup:


The GX Developer is used to create the network parameters and automatic refresh parameters, which are then written to the PLC CPU.
GX Developer
Network parameters
Automatic refresh parameters
PLC CPU
CC-Link system parameter area
Network parameters
Automatic refresh parameters
Master station
Parameter memory
Network parameters
When the PLC system is powered ON or the PLC CPU is reset, the network parameters in the PLC CPU are transferred to the master station and the data link is automatically started.
GX Developer
Network parameters
Automatic refresh parameters
PLC CPU
CC-Link system parameter area
Network parameters
Automatic refresh parameters
Master station
Parameter memory
Network parameters

6

## 6.1.3 Procedure from parameter settings to data link startup with dedicated instruction

Follow the procedure below from parameter settings to data link startup:


GX Developer is used to create the PLC parameters (I/O assignment setting) and a sequence program (containing the RLPASET instruction), which are then written to the PLC CPU.
GX Developer
PLC parameter
Sequence program (RLPASET instruction)
PLC CPU
Program memory
PLC parameter
Sequence program (RLPASET instruction)
Master station
Parameter area
Network parameter
Turn the power supply to the PLC system on, or reset the PLC CPU. Stop and then run the PLC CPU to execute the sequence program. The network parameters are set and the data link is started by the RLPASET instruction. The RLPASET instruction is completed after the data link is started.
GX Developer
PLC parameter
Sequence program (RLPASET instruction)
PLC CPU
Program memory
PLC parameter
Sequence program (RLPASET instruction)
Master station
Parameter area
Network parameter

## 6.2 Parameter Setting Items

Table 6.1 lists the items to be stored in the master station parameter memory.

Table 6.1 Parameter setting items (1/2)

| Setting item | Description | Reference section | Master station | Local station | Standby master station |
|---|---|---|---|---|---|
| Data link disorder station setting | Sets the input data status from the data link disorder station.<br>Default value : Clear<br>Setting range : Hold input data<br>: Clear | Section 4.3.4 | ○ | ○ | ○ |
| Case of CPU STOP setting | Sets whether slave stations will be refreshed or compulsorily cleared in case of PLC CPU STOP.<br>Default value : Refresh<br>Setting range : Refresh<br>: Clears compulsorily | Section 4.3.5 | ○ | ○ | ○ |
| Number of occupied stations * | Sets the number of occupied local and standby master stations.<br>Default value : Occupies 1 station<br>Setting range : Occupies 1 to 4 stations | ——— | × | ○ | ○ |
| Expanded cyclic setting | Makes the expanded cyclic setting of the local station.<br>Default value : single<br>Setting range : single, double, quadruple, octuple | Section 4.4.14 | × | ○ | ○ |
| Number of connected modules | Sets the total number of remote stations, local stations, intelligent device stations and standby master station that are connected to the master station (including reserved stations).<br>Default value : 64 (modules)<br>Setting range : 1 to 64 (modules) | ——— | ○ | × | × |
| Number of retries | Sets the number of retries when a communication error occurs.<br>Default value : 3 (times)<br>Setting range : 1 to 7 (times) | ——— | ○ | × | × |
| Number of automatic return modules | Sets the total number of remote stations, local stations, intelligent device stations and standby master station that can be returned to system operation by a single link scan.<br>Default value : 1 (module)<br>Setting range : 1 to 10 (modules) | Section 4.3.2 | ○ | × | × |
| Standby master station specification | Specifies the station number of the standby master station.<br>Default value : Blank (no standby master station specified)<br>Setting range : Blank, 1 to 64 (Blank: No standby master station specified) | Section 4.3.6 | ○ | × | × |
| Operation specification when CPU is down | Specifies the data link status when a master station PLC CPU error occurs.<br>Default value : Stop<br>Setting range : Stop<br>: Continue | Section 4.3.3 | ○ | × | × |
| Scan mode specification | Specifies either the synchronous or asynchronous mode for sequence scan.<br>Default value : Asynchronous<br>Setting range : Asynchronous<br>: Synchronous | Section 4.4.8 | ○ | × | × |
| Delay time setting | Set 0 for the delay time. | ——— | ○ | × | × |
| Reserved station specification | Specifies the reserved station.<br>Default value : Not specified<br>Setting range : Not specified<br>: Specified | Section 4.4.6 | ○ | × | × |
| Error invalid station specification | Specifies the error invalid station.<br>Default value : Not specified<br>Setting range : Not specified<br>: Specified | Section 4.4.7 | ○ | × | × |

* "Number of exclusive stations" on the screen is described as "Number of occupied stations" in this manual.
"Exclusive station 1" on the screen is described as "Occupies 1 station" in this manual.

Table 6.1 Parameter setting items (2/2)

| Setting item | Description | Reference section | Master station | Local station | Standby master station |
|---|---|---|---|---|---|
| Station information | Sets the type of the connected remote station, local station, intelligent device station and standby master station.<br>Default value : Ver.1 remote I/O station, occupies 1 station, station number 1 to Ver.1 remote I/O station, occupies 1 station, station number 64<br>Setting range<br>Station type : Remote I/O station, remote device station, intelligent device station/Ver.1, Ver.2 (single, double, quadruple, octuple)<br>Number of occupied stations : 1 to 4<br>Station number : 1 to 64 | ——— | ○ | × | × |
| Assignments of communication buffer and automatic update buffer | Specifies the assignments of buffer memory sizes during transient transmission to a local station, a standby master station and an intelligent device station.<br>Default values<br>Send buffer size : $40_H$ (64) (word)<br>Receive buffer size : $40_H$ (64) (word)<br>Automatic update buffer size : $80_H$ (128) (word)<br>Setting range<br>• Communication buffer size : $0_H$ (0) (word) (Not specified), or $40_H$ (64) (word) to $1000_H$ (4096) (word)<br>However, the total communication buffer size must be $1000_H$ (4096) (word) or less.<br>• Automatic update buffer : $0_H$ (0) (word) (Not specified), or $80_H$ (128) (word) to $1000_H$ (4096) (word)<br>However, the total automatic buffer size must be $1000_H$ (4096) (word) or less. | ——— | ○ | × | × |

POINT

(1) For the communication buffer size, specify the size that is calculated by adding seven words to the data size to be sent or received.
For the automatic update buffer size, specify the size required for each intelligent device station.

(2) The network parameters other than operational settings and mode setting are also made valid when the PLC CPU is switched from STOP to RUN.

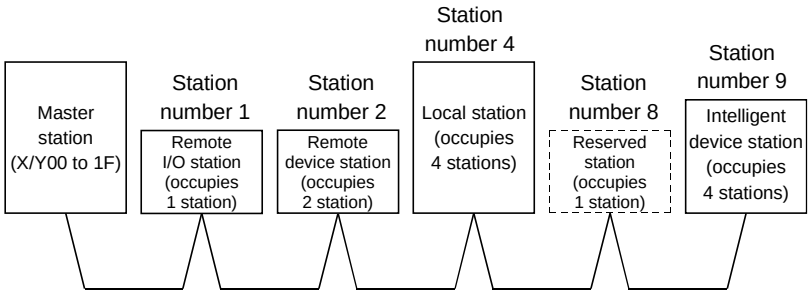
Table 6.2 indicates the reference sections for the detailed explanation of the parameter setting methods.

Table 6.2

| | Mode | Reference section |
|---|---|---|
| Parameter setting with GX Developer | Remote net ver.1 mode | Section 6.3 |
| | Remote net ver.2 mode | Section 6.4 |
| | Remote net additional mode | Section 6.5 |
| | Remote I/O net mode | Section 6.6 |
| Parameter setting with dedicated instruction | Remote net ver.1 mode | Section 6.7 |
| | Remote net ver.2 mode | |
| | Remote net additional mode | |

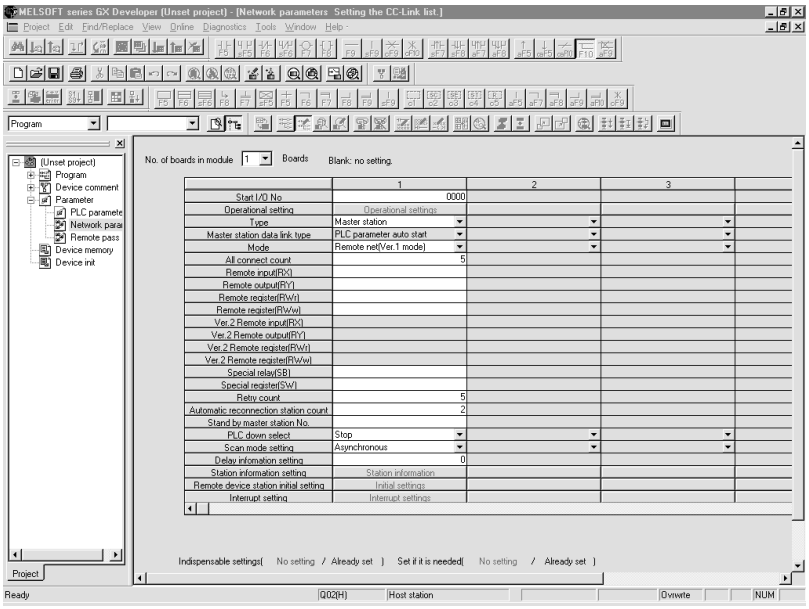
## 6.3 Example of Parameter Settings with GX Developer (Remote net ver.1 mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual.
The explanations in this section are based on the following example of the system configuration.


Master station (X/Y00 to 1F)
Station number 1
Remote I/O station (occupies 1 station)
Station number 2
Remote device station (occupies 2 stations)
Station number 4
Local station (occupies 4 stations)
Station number 8
Reserved station (occupies 1 station)
Station number 9
Intelligent device station (occupies 4 stations)

### 6.3.1 Master station network parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting
Type Master station
Master station data link type PLC parameter auto start
Mode Remote net(Ver.1 mode)
All connect count 5
Remote input(RX)
Remote output(RY)
Remote register(RWr)
Remote register(RWw)
Ver.2 Remote input(RX)
Ver.2 Remote output(RY)
Ver.2 Remote register(RWr)
Ver.2 Remote register(RWw)
Special relay(SB)
Special register(SW)
Retry count 5
Automatic reconnection station count 2
Stand by master station No.
PLC down select Stop
Scan mode setting Asynchronous
Delay infomation setting 0
Station information setting
Remote device station initial setting
Interrupt setting
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station
Overwrite
NUM

(2) Set the network parameters using the following procedure.

(a) Set the "No. of boards in module " for which the network parameters are to be set.

Default value: None
Setting range: 0 to 4 (Boards)*
* Modules for the parameter setting with the RLPASET instruction should not be included in the setting for "No. of boards in module ".

Example) Set 1 (Board).

(b) Set the "Start I/O No." for the master station.

Default value: None
Setting range: 0000 to 0FE0

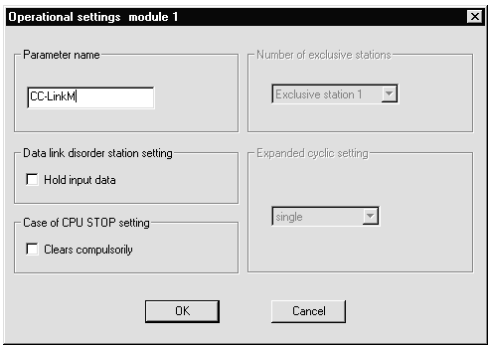
Example) Set 0000.

(c) Set the Parameter name using "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkM".



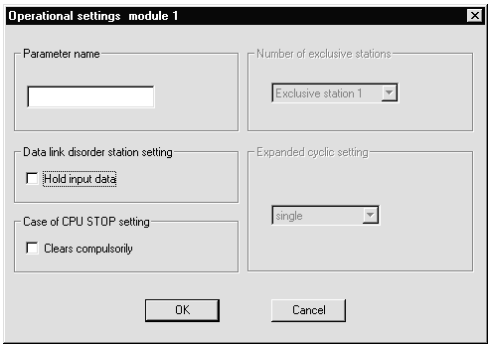

(d) Set the input status for the data link error station using "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).



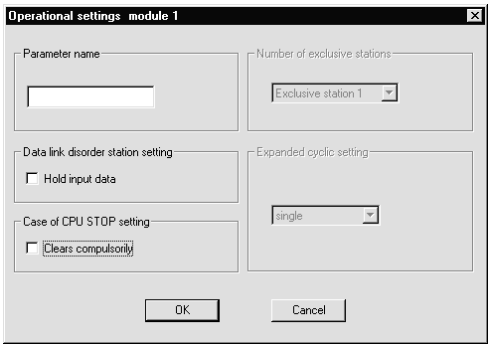

(e) Set the slave station refresh/compulsory clear setting at PLC CPU STOP using "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).



(f) Set the station type using "Type".
Default value: Master station
Setting range: Master station
Master station (Duplex function)
Local station
Standby master station
Example) Set to Master station.

(g) Set the CC-Link mode using "Mode".
Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line
Example) Set to Remote net (Ver.1 mode).

(h) Set the total number of connected stations in the CC-Link system including reserved stations using "All connect count".
Default value: 64 (modules)
Setting range: 1 to 64 (modules)
Example) Set to 5 (modules).

(i) Set the number of retries using "Retry count", when a communication error occurs.
Default value: 3 (times)
Setting range: 1 to 7 (times)
Example) Set to 5 (times).

(j) Set the number of modules that can return to system operation by a single link scan using "Automatic reconnection station count".
Default value: 1 (module)
Setting range: 1 to 10 (modules)
Example) Set to 2 (modules).

(k) Set the station number for the standby master station using "Standby master station No.".
Default value: Blank (No standby master station specified)
Setting range: Blank, 1 to 64 (Blank: No standby master station specified)
Example) Set to blank (No standby master station specified).

(l) Set the data link status using "PLC down select", when a master station PLC CPU error occurs.
Default value: Stop
Setting range: Stop
Continue
Example) Set to Stop.

(m) Set whether the link scan for the sequence scan is synchronous or asynchronous using "Scan mode setting".
Default value: Asynchronous
Setting range: Asynchronous
Synchronous
Example) Set to Asynchronous.

(n) Set 0 for the delay time.

(o) Set the station data using "Station information settings".

Default value: Remote I/O station, single, Occupies 1 station, 32 points, or no setting for reserved stations/error invalid.

Setting range: Station type - No setting
Remote I/O station
Remote device station
Intelligent device station (including local station and standby master station)

Expanded cyclic setting (cannot be changed)-
single

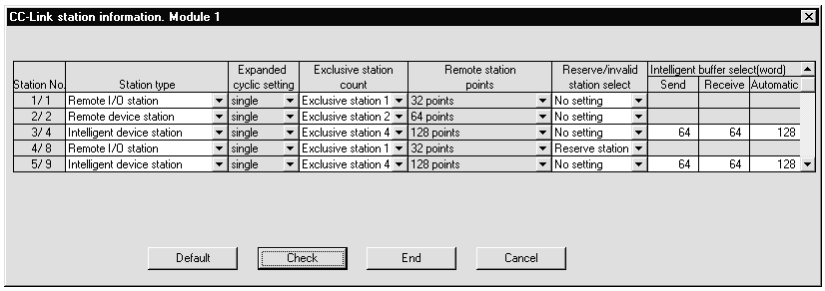
Number of occupied stations -
No setting
Occupies 1 station
Occupies 2 stations
Occupies 3 stations
Occupies 4 stations

Remote station points (cannot be changed)-
32 points [when occupies 1 station]
64 points [when occupies 2 stations]
96 points [when occupies 3 stations]
128 points [when occupies 4 stations]

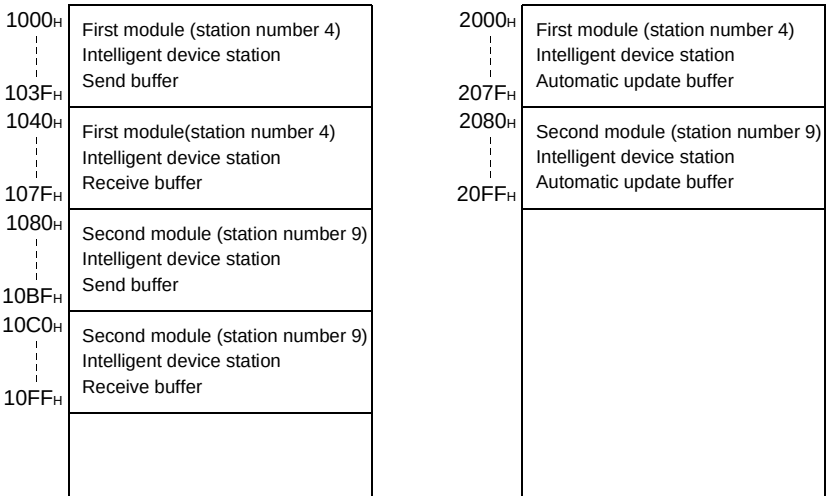
Reserved/invalid station select -
No setting
Reserved station
Invalid station (error invalid station)

Intelligent buffer select (word) -
No setting
Send 0, 64 to 4096
Receive 0, 64 to 4096
Automatic 0, 128 to 4096

Example) Set the station data according to the system configuration specified in Section 6.3.


CC-Link station information. Module 1
Station No.
Station type
Expanded cyclic setting
Exclusive station count
Remote station points
Reserve/invalid station select
Intelligent buffer select(word)
Send
Receive
Automatic
1/ 1 Remote I/O station single Exclusive station 1 32 points No setting
2/ 2 Remote device station single Exclusive station 2 64 points No setting
3/ 4 Intelligent device station single Exclusive station 4 128 points No setting 64 64 128
4/ 8 Remote I/O station single Exclusive station 1 32 points Reserve station
5/ 9 Intelligent device station single Exclusive station 4 128 points No setting 64 64 128
Default
Check
End
Cancel

(3) The following shows the results of the communication buffer and automatic update buffer assignments.

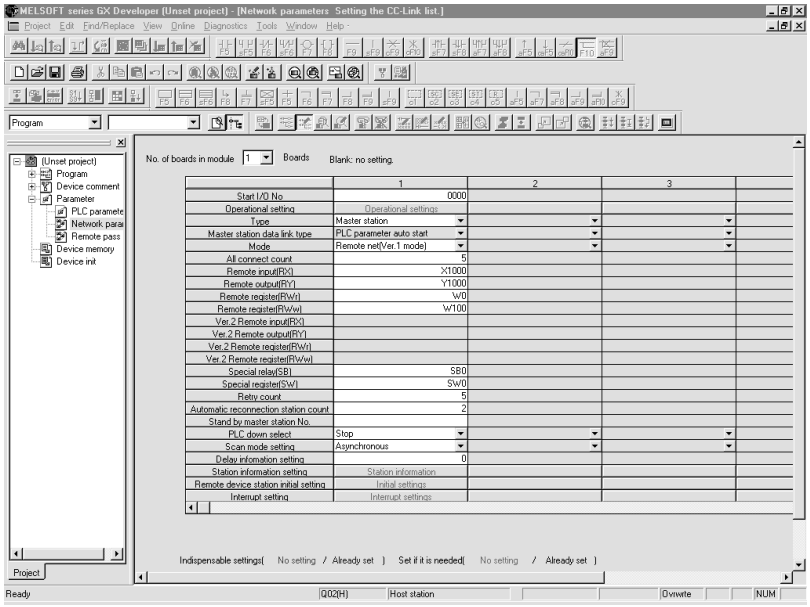




6 - 9

## 6.3.2 Master station automatic refresh parameter settings

(1) The following shows an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting
Type Master station
Master station data link type PLC parameter auto start
Mode Remote net(Ver.1 mode)
All connect count 5
Remote input(RX) X1000
Remote output(RY) Y1000
Remote register(RWr) W0
Remote register(RWw) W100
Ver.2 Remote input(RX)
Ver.2 Remote output(RY)
Ver.2 Remote register(RWr)
Ver.2 Remote register(RWw)
Special relay(SB) SB0
Special register(SW) SW0
Retry count 5
Automatic reconnection station count 2
Stand by master station No.
PLC down select Stop
Scan mode setting Asynchronous
Delay infomation setting 0
Station information setting
Remote device station initial setting
Interrupt setting
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station
Overwrite
NUM

(2) Set the automatic refresh parameters using the following procedure.

(a) Set the remote input (RX) refresh device using "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

(b) Set the remote output (RY) refresh device using "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

(c) Set the remote register (RWr) refresh device using "Remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

(d) Set the remote register (RWw) refresh device using "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to W100.

(e) Set the special relay (SB) refresh device using "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

(f) Set the special register (SW) refresh device using "Special register (SW)".

Default value: None

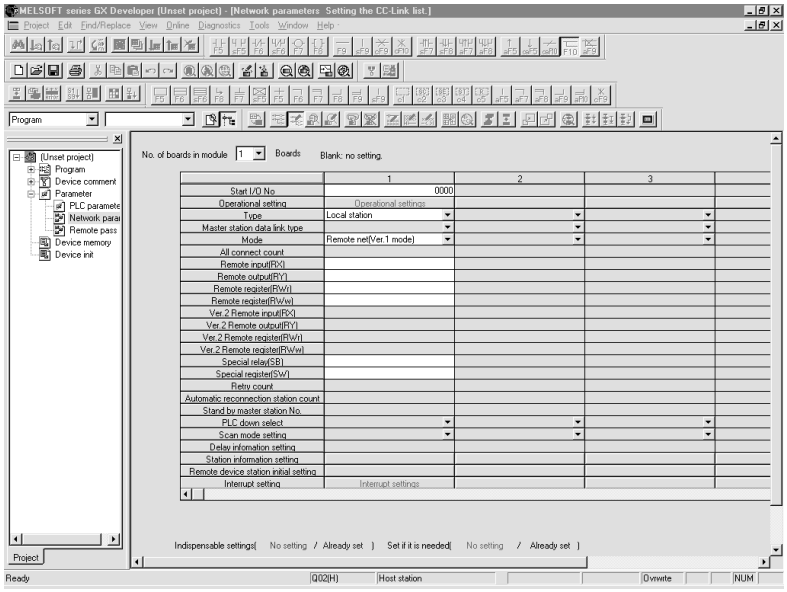
Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

| POINT |
| --- |
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

## 6.3.3 Local station network parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.




(2) Set the network parameters using the following procedure.

(a) Set the "No. of boards in module " for which the network parameters are to be set.

Default value: None
Setting range: 0 to 4 (Boards)

Example) Set 1 (Board).

(b) Set the "Start I/O No." for the local station.

Default value: None
Setting range: 0000 to 0FE0

Example) Set 0000.

(c) Set the station type using "Type".

Default value: Master station
Setting range: Master station
Master station (Duplex function)
Local station
Standby master station

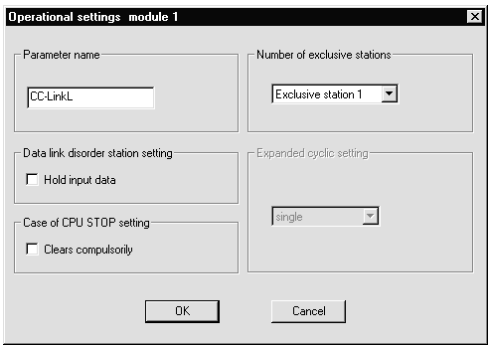
Example) Set to Local station.

(d) Set the Parameter name using "Operational settings". (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkL".



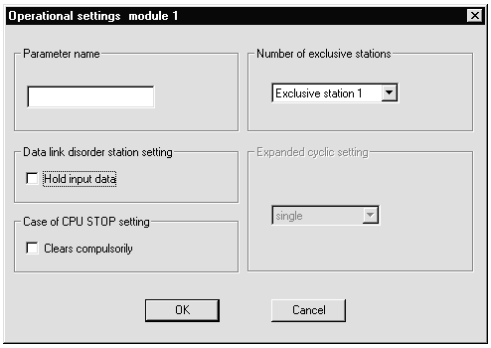

(e) Set the input status for the data link error station using "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).



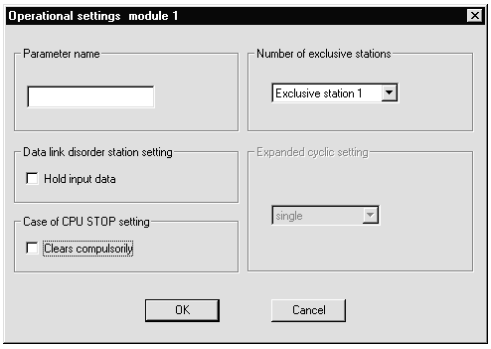

(f) Set the slave station refresh/compulsory clear setting at PLC CPU STOP using "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

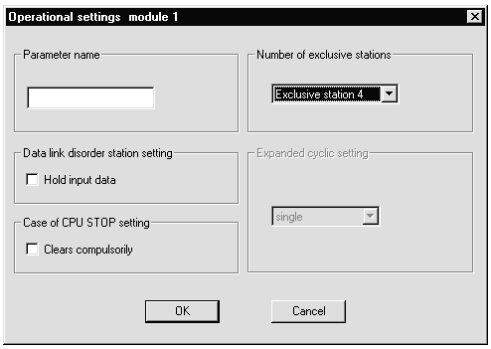
Example) Set to Refresh ("Clears compulsorily " not checked).



(g) Set the number of occupied local stations using "Number of occupied stations".

Default value: Occupies 1 station
Setting range: Occupies 1 station
Occupies 2 stations
Occupies 3 stations
Occupies 4 stations

Example) Set to Occupies 4 stations



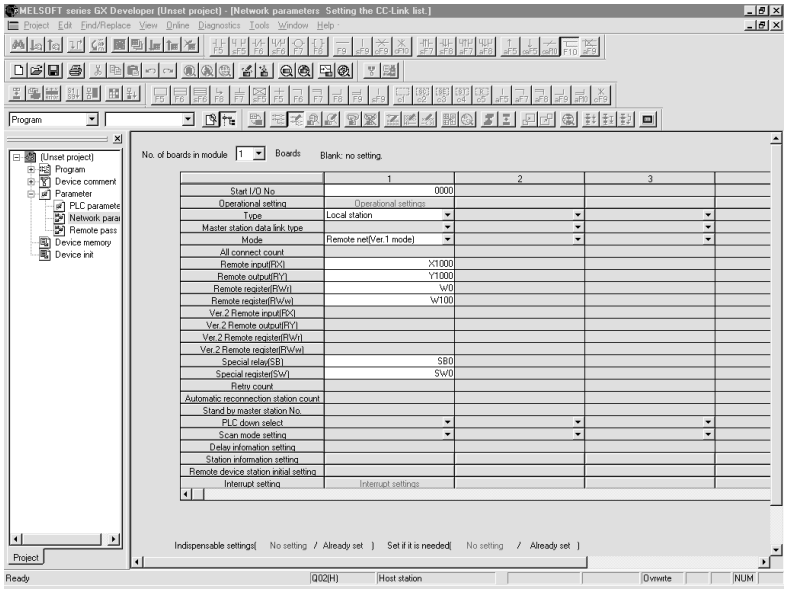

(h) Set the CC-Link mode using "Mode".

Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line

Example) Set to Remote net (Ver.1 mode).

## 6.3.4 Local station automatic refresh parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list.]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting Operational settings
Type Local station
Master station data link type
Mode Remote net(Ver.1 mode)
All connect count
Remote input(RX) X1000
Remote output(RY) Y1000
Remote register(RWr) W0
Remote register(RWw) W100
Ver.2 Remote input(RX)
Ver.2 Remote output(RY)
Ver.2 Remote register(RWr)
Ver.2 Remote register(RWw)
Special relay(SB) SB0
Special register(SW) SW0
Retry count
Automatic reconnection station count
Stand by master station No.
PLC down select
Scan mode setting
Delay information setting
Station information setting
Remote device station initial setting
Interrupt setting Interrupt settings
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station
Overwrite
NUM

(2) Set the automatic refresh parameters using the following procedure.

(a) Set the remote input (RX) refresh device using "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

(b) Set the remote output (RY) refresh device using "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

(c) Set the remote register (RWr) refresh device using "Remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

(d) Set the remote register (RWw) refresh device using "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to W100.

(e) Set the special relay (SB) refresh device using "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

(f) Set the special register (SW) refresh device using "Special register (SW)".

Default value: None

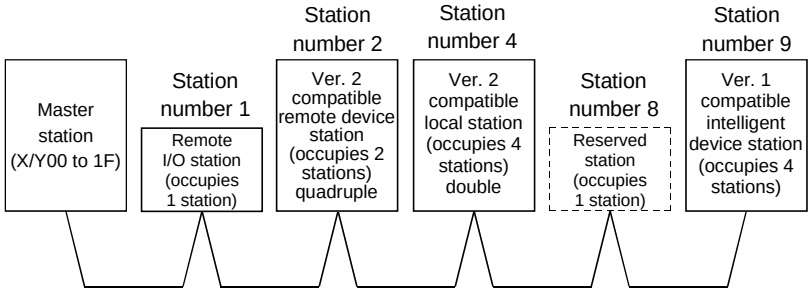
Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

| POINT |
| --- |
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

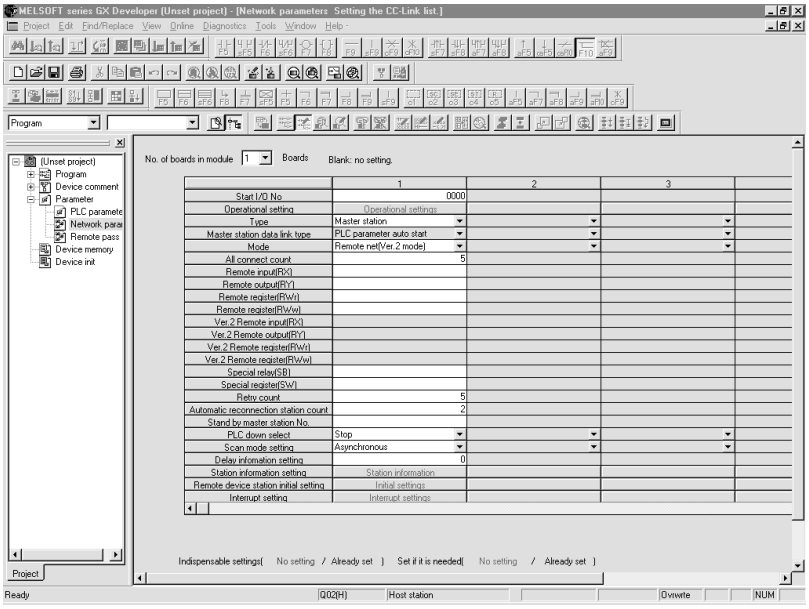
## 6.4 Example of Parameter Settings with GX Developer (Remote net ver.2 mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual.
The explanations in this section are based on the following example of the system configuration.


Master station (X/Y00 to 1F)
Station number 1
Remote I/O station (occupies 1 station)
Station number 2
Ver. 2 compatible remote device station (occupies 2 stations) quadruple
Station number 4
Ver. 2 compatible local station (occupies 4 stations) double
Station number 8
Reserved station (occupies 1 station)
Station number 9
Ver. 1 compatible intelligent device station (occupies 4 stations)

### 6.4.1 Master station network parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list.]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting
Type Master station
Master station data link type PLC parameter auto start
Mode Remote net(Ver.2 mode)
All connect count 5
Retry count 5
Automatic reconnection station count 2
PLC down select Stop
Scan mode setting Asynchronous
Delay infomation setting 0
Station information setting
Remote device station initial setting
Interrupt setting
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station

(2) Set the network parameters using the following procedure.

(a) Set the "No. of boards in module " for which the network parameters are to be set.

Default value: None
Setting range: 0 to 4 (Boards)*
* Modules for the parameter setting with the RLPASET instruction should not be included in the setting for "No. of boards in module".

Example) Set 1 (Board).

(b) Set the "Start I/O No." for the master station.

Default value: None
Setting range: 0000 to 0FE0

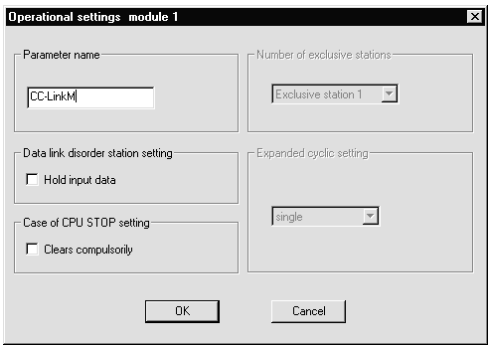
Example) Set 0000.

(c) Set the Parameter name using "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkM".



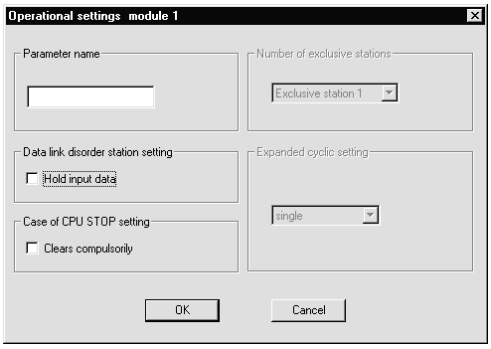

(d) Set the input status for the data link error station using "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).



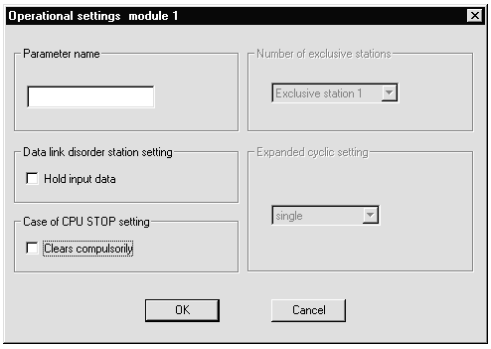

(e) Set the slave station refresh/compulsory clear setting at PLC CPU STOP using "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).



(f) Set the station type using "Type".
Default value: Master station
Setting range: Master station
Master station (Duplex function)
Local station
Standby master station
Example) Set to Master station.

(g) Set the CC-Link mode using "Mode".
Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line
Example) Set to Remote net (Ver.2 mode).

(h) Set the total number of connected stations in the CC-Link system including reserved stations using "All connect count".
Default value: 64 (modules)
Setting range: 1 to 64 (modules)
Example) Set to 5 (modules).

(i) Set the number of retries using "Retry count", when a communication error occurs.
Default value: 3 (times)
Setting range: 1 to 7 (times)
Example) Set to 5 (times).

(j) Set the number of modules that can return to system operation by a single link scan using "Automatic reconnection station count".
Default value: 1 (module)
Setting range: 1 to 10 (modules)
Example) Set to 2 (modules).

(k) Set the station number for the standby master station using "Standby master station No.".
Default value: Blank (No standby master station specified)
Setting range: Blank, 1 to 64 (Blank: No standby master station specified)
Example) Set to blank (No standby master station specified).

(l) Set the data link status using "PLC down select", when a master station PLC CPU error occurs.
Default value: Stop
Setting range: Stop
Continue
Example) Set to Stop.

(m) Set whether the link scan for the sequence scan is synchronous or asynchronous using "Scan mode setting".
Default value: Asynchronous
Setting range: Asynchronous
Synchronous
Example) Set to Asynchronous.

(n) Set 0 for the delay time.

(o) Set the station data using "Station information settings".

Default value: Ver.1 Remote I/O station, single, Occupies 1 station, 32 points, or no setting for reserved stations/error invalid.

Setting range: Station type - No setting
Ver.1 Remote I/O station
Ver.1 Remote device station
Ver.1 Intelligent device station (Local and standby master stations included)
Ver.2 Remote device station
Ver.2 Intelligent device station (Local and standby master stations included)

Expanded cyclic setting -
[When station type is ver. 1 compatible station]
single (cannot be changed)
[When station type is ver. 2 compatible station]
single
double
quadruple
octuple

Number of occupied stations -
No setting
Occupies 1 station
Occupies 2 stations
Occupies 3 stations
Occupies 4 stations

Remote station points -
[When station type is ver. 1 remote I/O station]
0 points (reserve station)
8 points
8points+8points(reserved)
16 points
32 points
[When station type is other than ver. 1 remote I/O station]
0 points (reserve station)
n points
n : Calculated automatically by GX Developer according to the number of occupied stations and expansion cyclic setting. Refer to Section 3.1 for the number of points.

Reserved/invalid station select -
No setting
Reserved station
Invalid station (error invalid station)

Intelligent buffer select (word) -

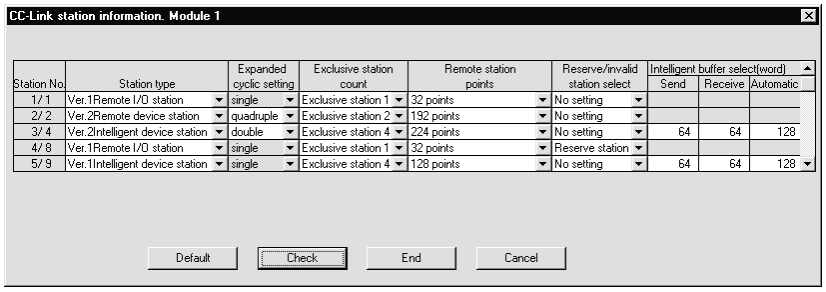
No setting

Send 0, 64 to 4096

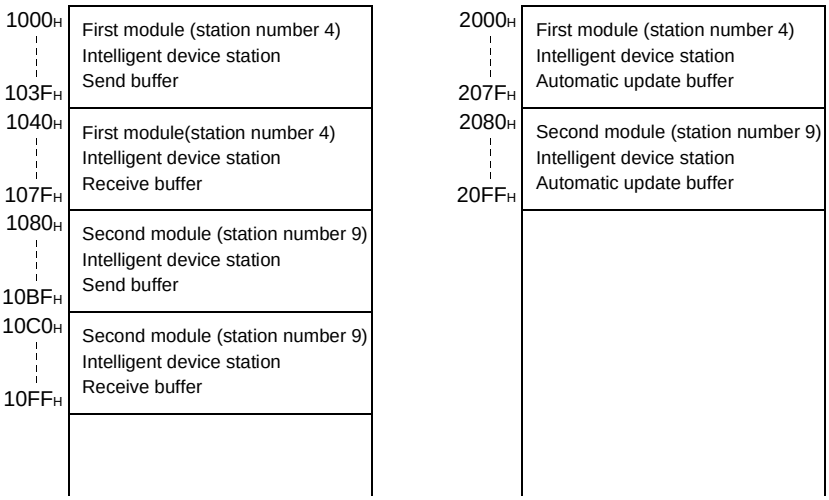
Receive 0, 64 to 4096

Automatic 0, 128 to 4096

Example) Set the station data according to the system configuration specified in Section 6.4.

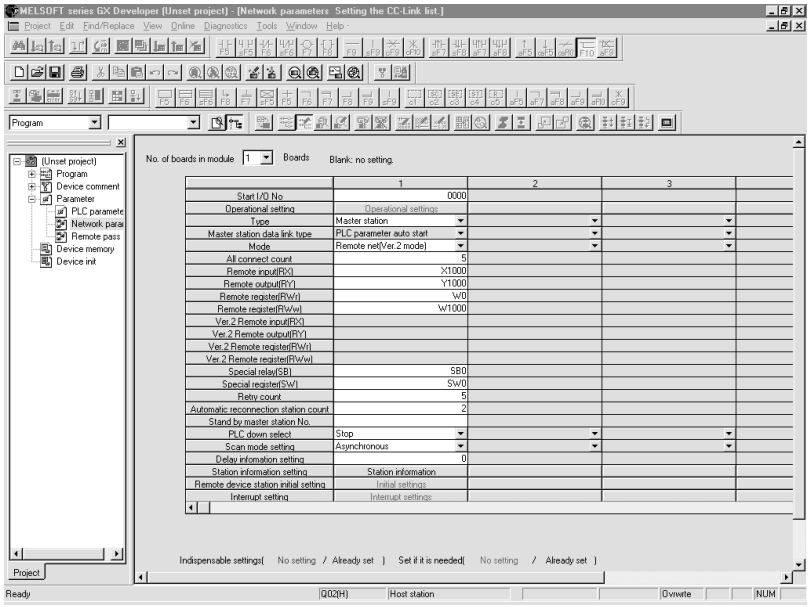

CC-Link station information. Module 1
Station No.
Station type
Expanded cyclic setting
Exclusive station count
Remote station points
Reserve/invalid station select
Intelligent buffer select(word)
Send
Receive
Automatic
1/ 1 Ver.1Remote I/O station single Exclusive station 1 32 points No setting
2/ 2 Ver.2Remote device station quadruple Exclusive station 2 192 points No setting
3/ 4 Ver.2Intelligent device station double Exclusive station 4 224 points No setting 64 64 128
4/ 8 Ver.1Remote I/O station single Exclusive station 1 32 points Reserve station
5/ 9 Ver.1Intelligent device station single Exclusive station 4 128 points No setting 64 64 128
Default
Check
End
Cancel

(3) The following shows the results of the communication buffer and automatic update buffer assignments.



## 6.4.2 Master station automatic refresh parameter settings

(1) The following shows an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting Operational settings
Type Master station
Master station data link type PLC parameter auto start
Mode Remote net(Ver.2 mode)
All connect count 5
Remote input(RX) X1000
Remote output(RY) Y1000
Remote register(RWr) W0
Remote register(RWw) W1000
Ver.2 Remote input(RX)
Ver.2 Remote output(RY)
Ver.2 Remote register(RWr)
Ver.2 Remote register(RWw)
Special relay(SB) SB0
Special register(SW) SW0
Retry count 5
Automatic reconnection station count 2
Stand by master station No.
PLC down select Stop
Scan mode setting Asynchronous
Delay infomation setting 0
Station information setting Station information
Remote device station initial setting Initial settings
Interrupt setting Interrupt settings
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station
Overwrite
NUM

(2) Set the automatic refresh parameters using the following procedure.

(a) Set the remote input (RX) refresh device using "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

(b) Set the remote output (RY) refresh device using "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

(c) Set the remote register (RWr) refresh device using "Remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

(d) Set the remote register (RWw) refresh device using "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to W1000.

(e) Set the special relay (SB) refresh device using "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

(f) Set the special register (SW) refresh device using "Special register (SW)".

Default value: None

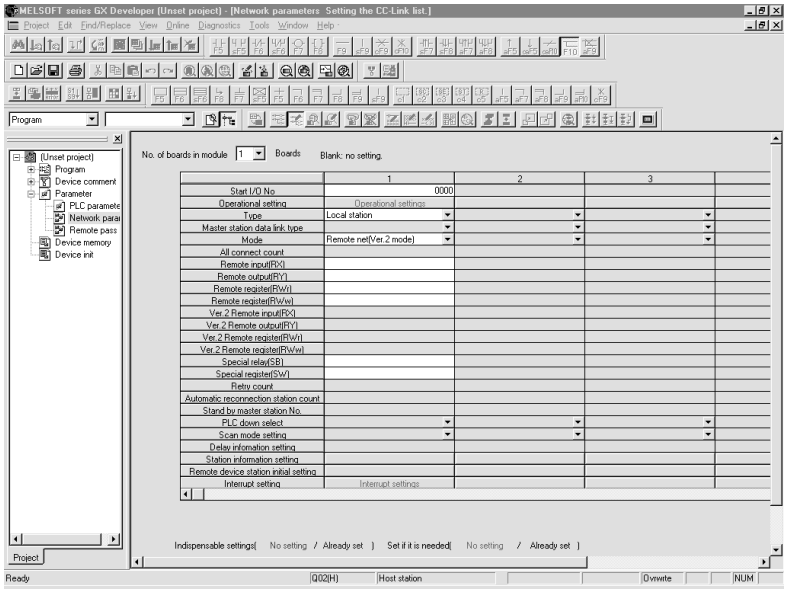
Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

| POINT |
| --- |
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

## 6.4.3 Local station network parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.




(2) Set the network parameters using the following procedure.

(a) Set the "No. of boards in module" for which the network parameters are to be set.

Default value: None
Setting range: 0 to 4 (Boards)

Example) Set 1 (Board).

(b) Set the "Start I/O No." for the local station.

Default value: None
Setting range: 0000 to 0FE0

Example) Set 0000.

(c) Set the station type using "Type".

Default value: Master station
Setting range: Master station
Master station (Duplex function)
Local station
Standby master station

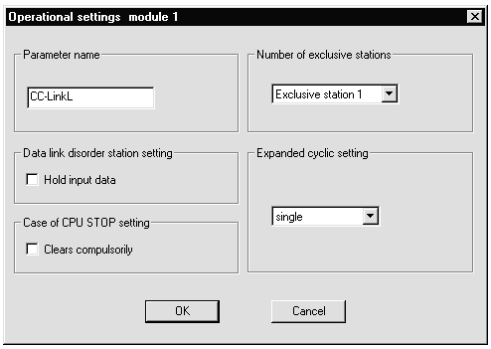
Example) Set to Local station.

(d) Set the Parameter name using "Operational settings". (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkL".



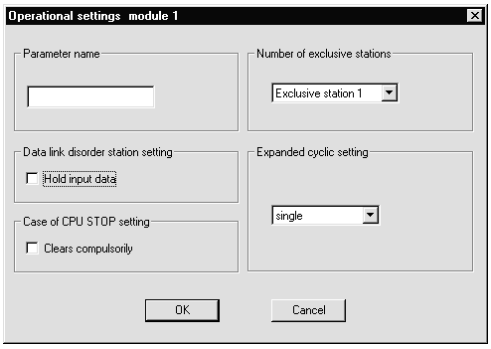

(e) Set the input status for the data link error station using "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).



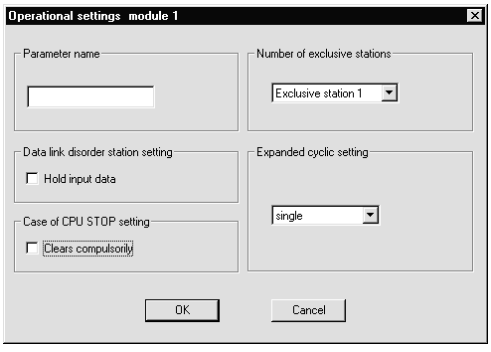

(f) Set the slave station refresh/compulsory clear setting at PLC CPU STOP using "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

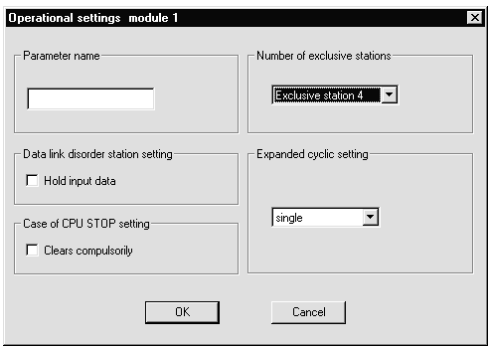
Example) Set to Refresh ("Clears compulsorily " not checked).



(g) Set the number of occupied local stations using "Number of occupied stations".

Default value: Occupies 1 station
Setting range: Occupies 1 station
Occupies 2 stations
Occupies 3 stations
Occupies 4 stations

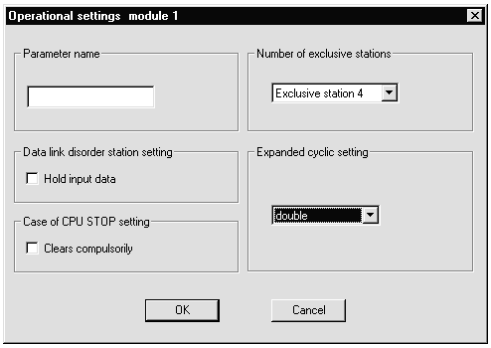
Example) Set to Occupies 4 stations




(h) Set the expanded cyclic setting of the local station using "Expanded cyclic setting".

Default value: single
Setting range: single
double
quadruple
octuple

Example) Set to double.



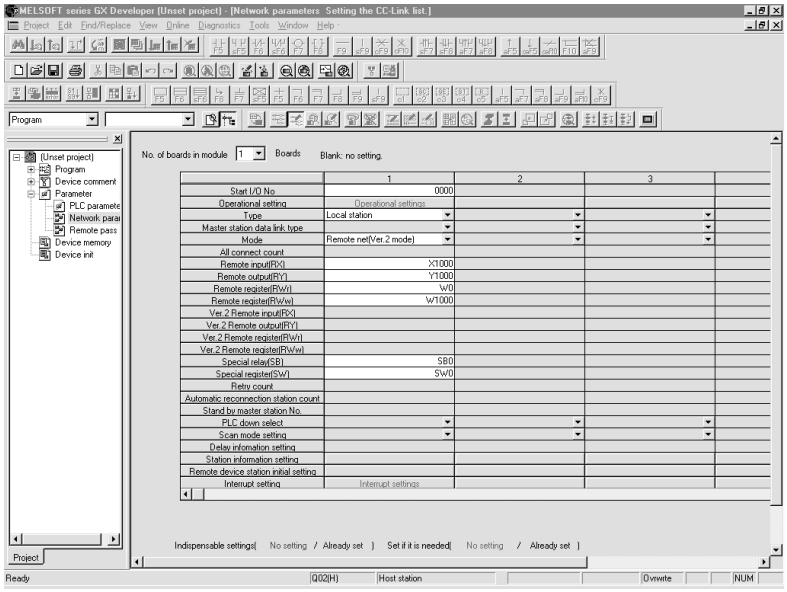

(i) Set the CC-Link mode using "Mode".

Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line

Example) Set to Remote net (Ver.2 mode).

## 6.4.4 Local station automatic refresh parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list.]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting Operational settings
Type Local station
Master station data link type
Mode Remote net(Ver.2 mode)
All connect count
Remote input(RX) X1000
Remote output(RY) Y1000
Remote register(RWr) W0
Remote register(RWw) W1000
Ver.2 Remote input(RX)
Ver.2 Remote output(RY)
Ver.2 Remote register(RWr)
Ver.2 Remote register(RWw)
Special relay(SB) SB0
Special register(SW) SW0
Retry count
Automatic reconnection station count
Stand by master station No.
PLC down select
Scan mode setting
Delay information setting
Station information setting
Remote device station initial setting
Interrupt setting Interrupt settings
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station
Overwrite
NUM

(2) Set the automatic refresh parameters using the following procedure.

(a) Set the remote input (RX) refresh device using "Remote input (RY)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

(b) Set the remote output (RY) refresh device using "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

(c) Set the remote register (RWr) refresh device using "Remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

(d) Set the remote register (RWw) refresh device using "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to W1000.

(e) Set the special relay (SB) refresh device using "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

(f) Set the special register (SW) refresh device using "Special register (SW)".

Default value: None

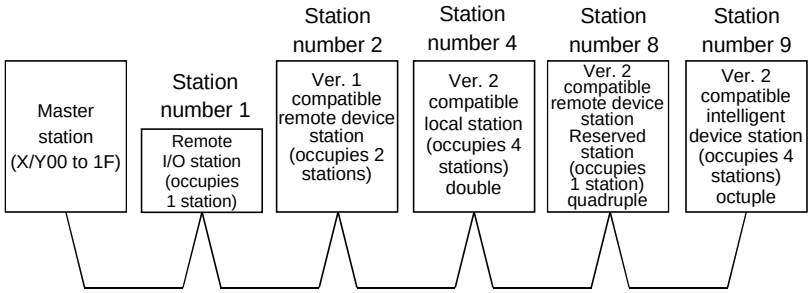
Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

| POINT |
| --- |
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

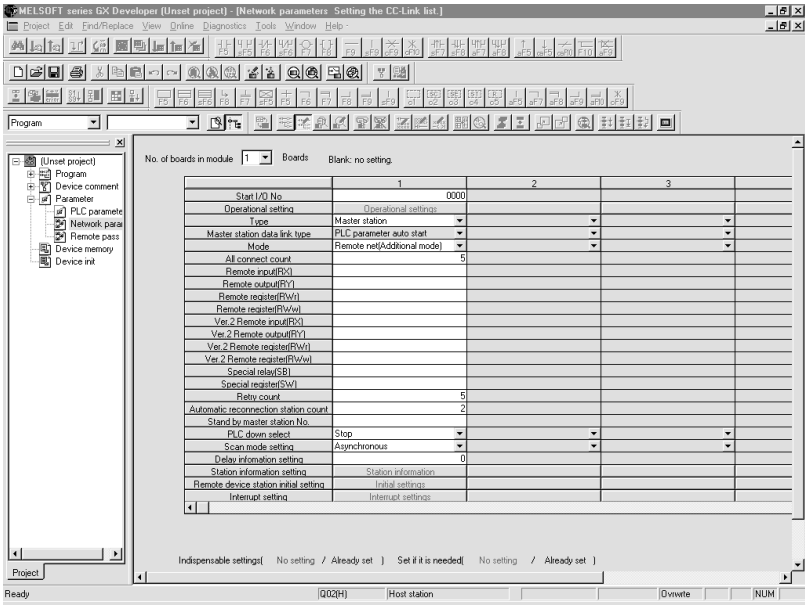
## 6.5 Example of Parameter Settings with GX Developer (Remote net additional mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual.
The explanations in this section are based on the following example of the system configuration.


Master station (X/Y00 to 1F)
Station number 1
Remote I/O station (occupies 1 station)
Station number 2
Ver. 1 compatible remote device station (occupies 2 stations)
Station number 4
Ver. 2 compatible local station (occupies 4 stations) double
Station number 8
Ver. 2 compatible remote device station Reserved station (occupies 1 station) quadruple
Station number 9
Ver. 2 compatible intelligent device station (occupies 4 stations) octuple

### 6.5.1 Master station network parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.




(2) Set the network parameters using the following procedure.

(a) Set the "No. of boards in module" for which the network parameters are to be set.

Default value: None
Setting range: 0 to 4 (Boards)*

* Modules for the parameter setting with the RLPASET instruction should not be included in the setting for "No. of boards in module".

Example) Set 1 (Board).

(b) Set the "Start I/O No." for the master station.

Default value: None
Setting range: 0000 to 0FE0

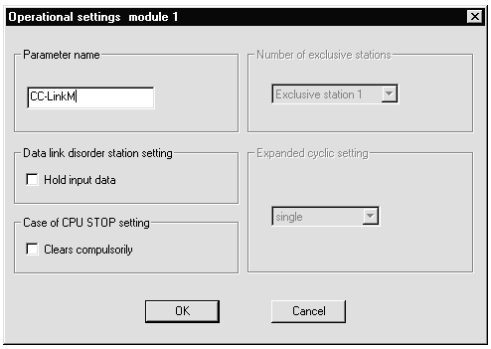
Example) Set 0000.

(c) Set the Parameter name using "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkM".



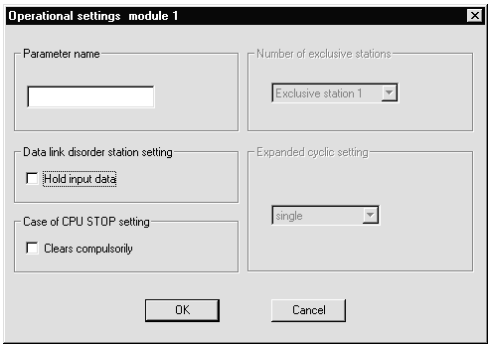

(d) Set the input status for the data link error station using "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).



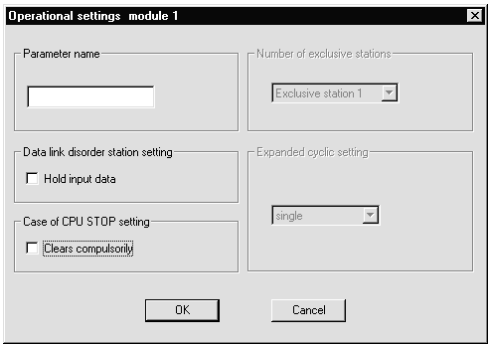

(e) Set the slave station refresh/compulsory clear setting at PLC CPU STOP using "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).



(f) Set the station type using "Type".
Default value: Master station
Setting range: Master station
Master station (Duplex function)
Local station
Standby master station
Example) Set to Master station.

(g) Set the CC-Link mode using "Mode".
Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line
Example) Set to Remote net (Additional mode).

(h) Set the total number of connected stations in the CC-Link system including reserved stations using "All connect count".
Default value: 64 (modules)
Setting range: 1 to 64 (modules)
Example) Set to 5 (modules).

(i) Set the number of retries using "Retry count", when a communication error occurs.
Default value: 3 (times)
Setting range: 1 to 7 (times)
Example) Set to 5 (times).

(j) Set the number of modules that can return to system operation by a single link scan using "Automatic reconnection station count".
Default value: 1 (module)
Setting range: 1 to 10 (modules)
Example) Set to 2 (modules).

(k) Set the station number for the standby master station using "Standby master station No.".
Default value: Blank (No standby master station specified)
Setting range: Blank, 1 to 64 (Blank: No standby master station specified)
Example) Set to blank (No standby master station specified).

(l) Set the data link status using "PLC down select", when a master station PLC CPU error occurs.
Default value: Stop
Setting range: Stop
Continue
Example) Set to Stop.

(m) Set whether the link scan for the sequence scan is synchronous or asynchronous using "Scan mode setting".
Default value: Asynchronous
Setting range: Asynchronous
Synchronous
Example) Set to Asynchronous.

(n) Set 0 for the delay time.

(o) Set the station data using "Station information settings".

Default value: Ver.1 Remote I/O station, single, Occupies 1 station, 32 points, or no setting for reserved stations/error invalid.

Setting range: Station type - No setting
Ver.1 Remote I/O station
Ver.1 Remote device station
Ver.1 Intelligent device station (Local and standby master stations included)
Ver.2 Remote device station
Ver.2 Intelligent device station (Local and standby master stations included)

Expanded cyclic setting -
[When station type is ver. 1 compatible station]
single (cannot be changed)
[When station type is ver. 2 compatible station]
single
double
quadruple
octuple

Number of occupied stations -
No setting
Occupies 1 station
Occupies 2 stations
Occupies 3 stations
Occupies 4 stations

Remote station points -
[When station type is ver. 1 remote I/O station]
0 points (reserve station)
8 points
8points+8points(reserved)
16 points
32 points
[When station type is other than ver. 1 remote I/O station]
0 points (reserve station)
n points
n : Calculated automatically by GX Developer according to the number of occupied stations and expansion cyclic setting. Refer to Section 3.1 for the number of points.

Reserved/invalid station select -
No setting
Reserved station
Invalid station (error invalid station)

Intelligent buffer select (word) -

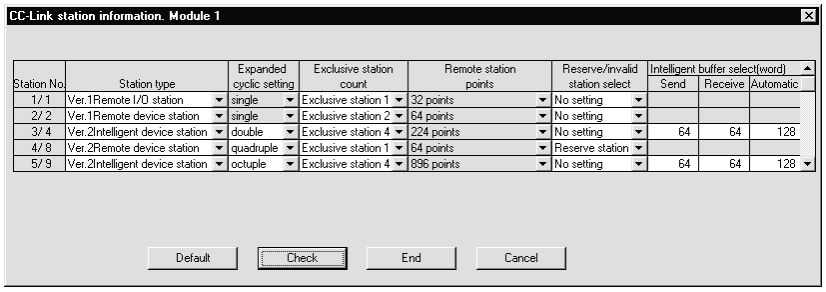
No setting

Send 0, 64 to 4096

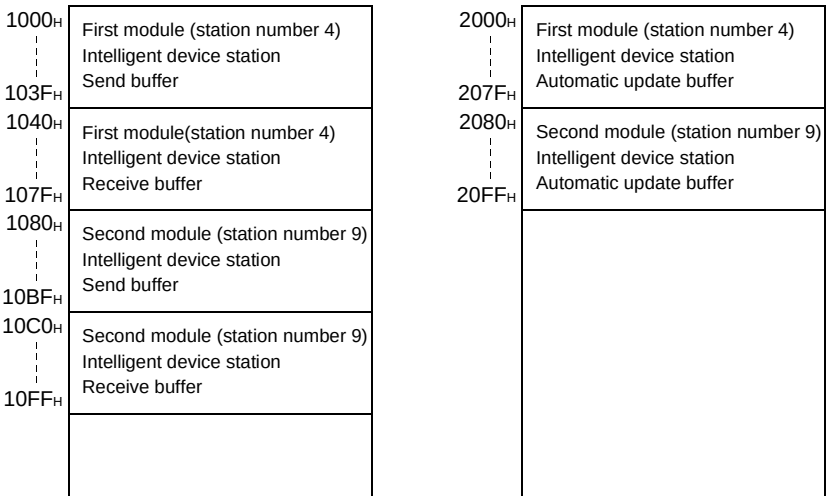
Receive 0, 64 to 4096

Automatic 0, 128 to 4096

Example) Set the station data according to the system configuration specified in Section 6.5.

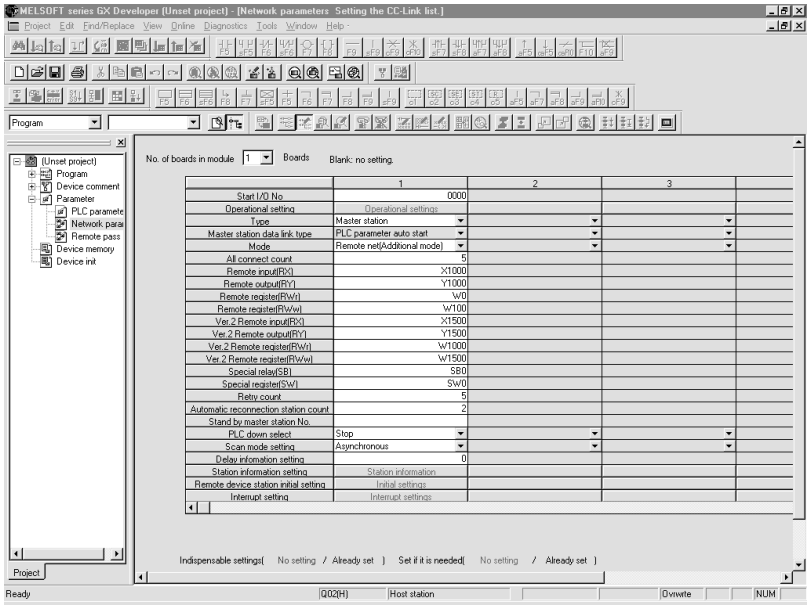

CC-Link station information. Module 1
Station No.
Station type
Expanded cyclic setting
Exclusive station count
Remote station points
Reserve/invalid station select
Intelligent buffer select(word)
Send
Receive
Automatic
1/ 1 Ver.1Remote I/O station single Exclusive station 1 32 points No setting
2/ 2 Ver.1Remote device station single Exclusive station 2 64 points No setting
3/ 4 Ver.2Intelligent device station double Exclusive station 4 224 points No setting 64 64 128
4/ 8 Ver.2Remote device station quadruple Exclusive station 1 64 points Reserve station
5/ 9 Ver.2Intelligent device station octuple Exclusive station 4 896 points No setting 64 64 128
Default
Check
End
Cancel

(3) The following shows the results of the communication buffer and automatic update buffer assignments.



## 6.5.2 Master station automatic refresh parameter settings

(1) The following shows an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting
Type Master station
Master station data link type PLC parameter auto start
Mode Remote net(Additional mode)
All connect count 5
Remote input(RX) X1000
Remote output(RY) Y1000
Remote register(RWr) W0
Remote register(RWw) W100
Ver.2 Remote input(RX) X1500
Ver.2 Remote output(RY) Y1500
Ver.2 Remote register(RWr) W1000
Ver.2 Remote register(RWw) W1500
Special relay(SB) SB0
Special register(SW) SW0
Retry count 5
Automatic reconnection station count 2
Stand by master station No.
PLC down select Stop
Scan mode setting Asynchronous
Delay infomation setting 0
Station information setting
Remote device station initial setting
Interrupt setting
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station
Overwrite
NUM

(2) Set the automatic refresh parameters using the following procedure.

(a) Set the remote input (RX) refresh device using "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

(b) Set the remote output (RY) refresh device using "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

(c) Set the remote register (RWr) refresh device using "Remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

(d) Set the remote register (RWw) refresh device using "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to W100.

(e) Set the ver. 2 compatible remote input (RX) refresh device using "Ver. 2 remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to X1500.

(f) Set the ver. 2 compatible remote output (RY) refresh device using "Ver. 2 remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to Y1500.

(g) Set the ver. 2 compatible remote register (RWr) refresh device using "Ver. 2 remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to W1000.

(h) Set the ver. 2 compatible remote register (RWw) refresh device using "Ver. 2 remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to W1500.

(i) Set the special relay (SB) refresh device using "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

(j) Set the special register (SW) refresh device using "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

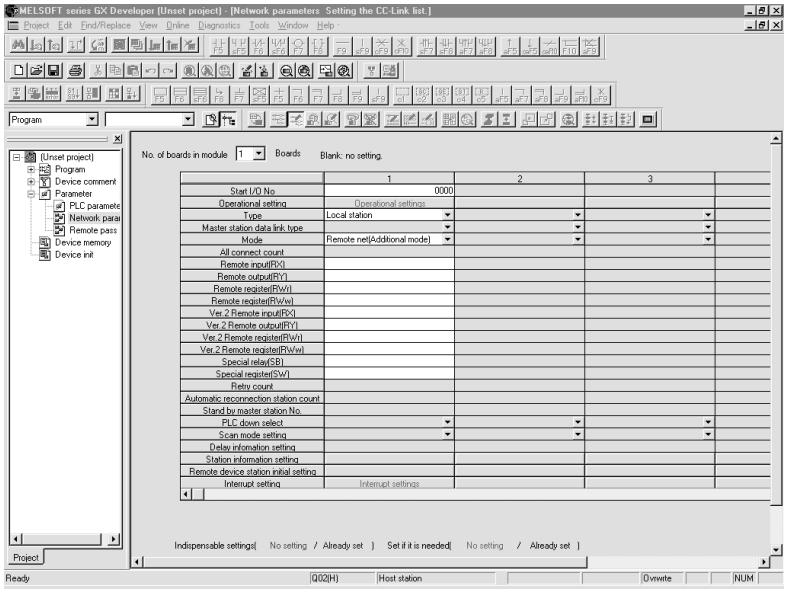
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

| POINT |
| --- |
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

## 6.5.3 Local station network parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.




(2) Set the network parameters using the following procedure.

(a) Set the "No. of boards in Boards" for which the network parameters are to be set.

Default value: None
Setting range: 0 to 4 (Boards)
Example) Set 1 (Board).

(b) Set the "Start I/O No." for the local station.

Default value: None
Setting range: 0000 to 0FE0
Example) Set 0000.

(c) Set the station type using "Type".

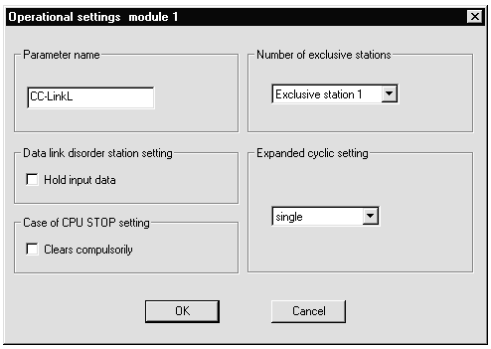
Default value: Master station
Setting range: Master station
Master station (Duplex function)
Local station
Standby master station
Example) Set to Local station.

(d) Set the Parameter name using "Operational settings". (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkL".



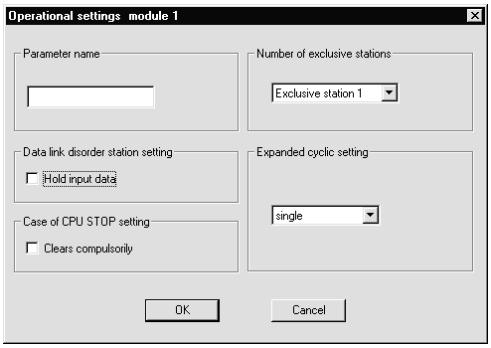

(e) Set the input status for the data link error station using "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).



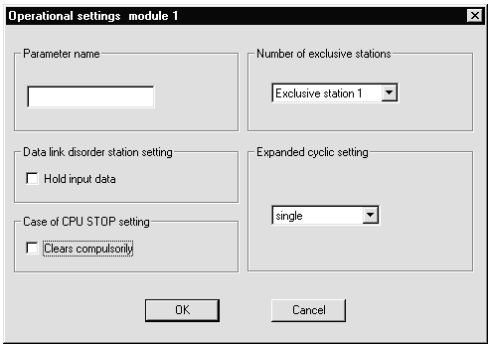

(f) Set the slave station refresh/compulsory clear setting at PLC CPU STOP using "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

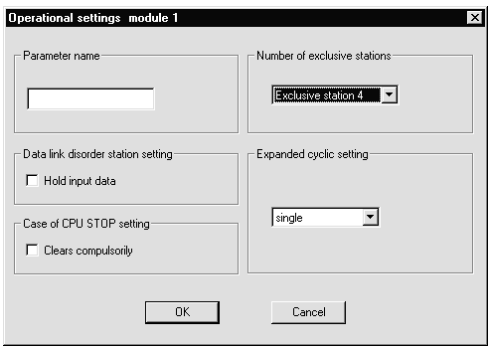
Example) Set to Refresh ("Clears compulsorily " not checked).



(g) Set the number of occupied local stations using "Number of occupied stations".

Default value: Occupies 1 station
Setting range: Occupies 1 station
Occupies 2 stations
Occupies 3 stations
Occupies 4 stations

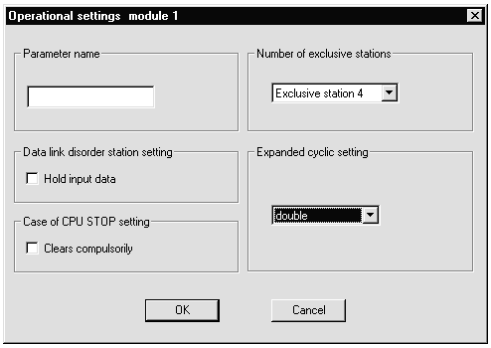
Example) Set to Occupies 4 stations




(h) Set the expanded cyclic setting of the local station using "Expanded cyclic setting".

Default value: single
Setting range: single
double
quadruple
octuple

Example) Set to double.



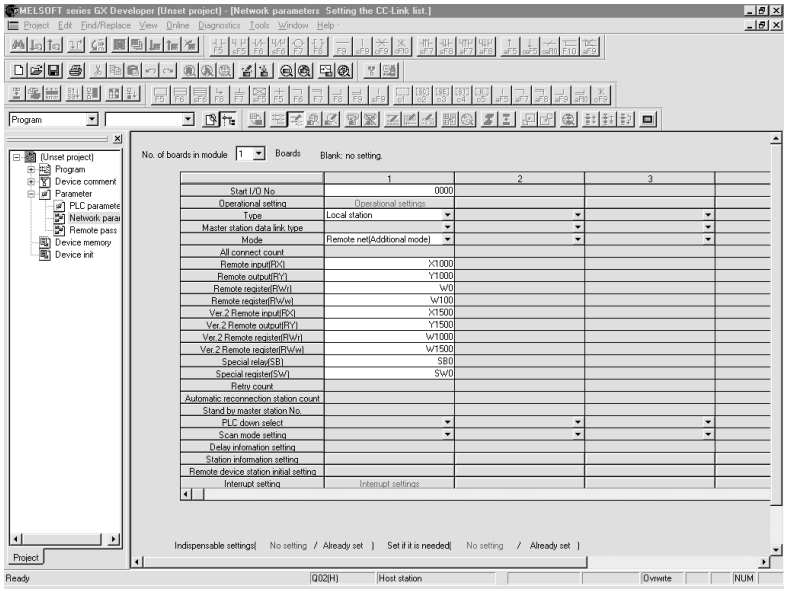

(i) Set the CC-Link mode using "Mode".

Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line

Example) Set to Remote net (Additional mode).

## 6.5.4 Local station automatic refresh parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.




(2) Set the automatic refresh parameters using the following procedure.

(a) Set the remote input (RX) refresh device using "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

(b) Set the remote output (RY) refresh device using "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

(c) Set the remote register (RWr) refresh device using "Remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

(d) Set the remote register (RWw) refresh device using "Remote register (RWw)".

Default value: None
Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W100.

(e) Set the ver. 2 compatible remote input (RX) refresh device using "Ver. 2 remote input (RX)".

Default value: None
Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to X1500.

(f) Set the ver. 2 compatible remote output (RY) refresh device using "Ver. 2 remote output (RY)".

Default value: None
Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to Y1500.

(g) Set the ver. 2 compatible remote register (RWr) refresh device using "Ver. 2 remote register (RWr)".

Default value: None
Setting range: Device name - Select from M, L, B, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W1000.

(h) Set the ver. 2 compatible remote register (RWw) refresh device using "Ver. 2 remote register (RWw)".

Default value: None
Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W1500.

(i) Set the special relay (SB) refresh device using "Special relay (SB)".

Default value: None
Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to SB0.

(j) Set the special register (SW) refresh device using "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

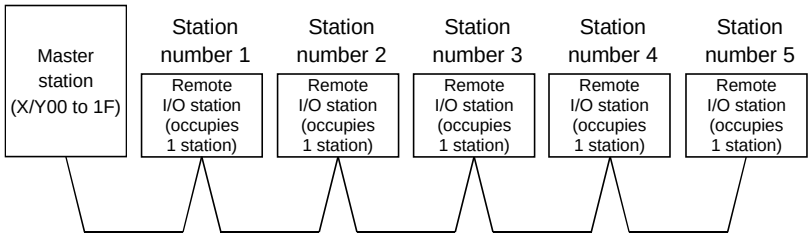
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

| POINT |
| --- |
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

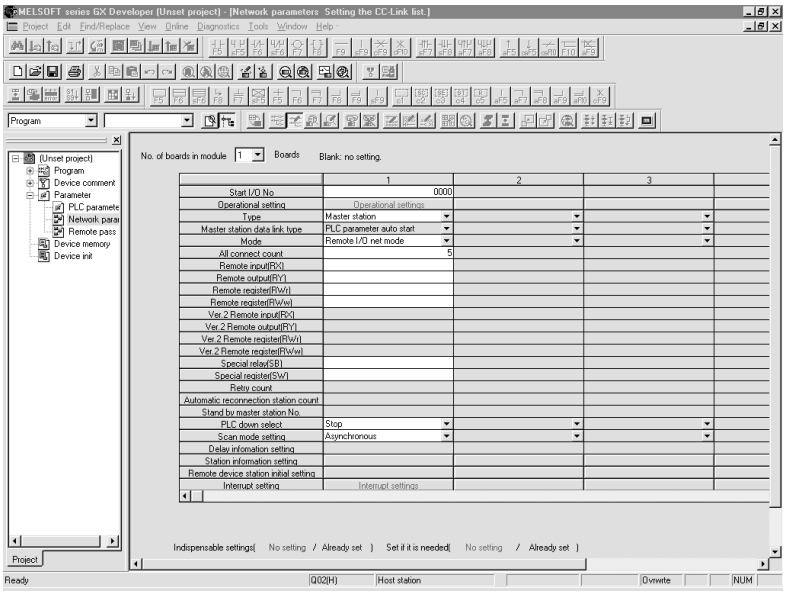
## 6.6 Example of Parameter Settings with GX Developer (Remote I/O net mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual.
The explanations in this section are based on the following example of the system configuration.


Master station (X/Y00 to 1F)
Station number 1
Remote I/O station (occupies 1 station)
Station number 2
Remote I/O station (occupies 1 station)
Station number 3
Remote I/O station (occupies 1 station)
Station number 4
Remote I/O station (occupies 1 station)
Station number 5
Remote I/O station (occupies 1 station)

### 6.6.1 Master station network parameter settings

(1) The following describes an example of the parameter settings. See (2) for actual settings.




(2) Set the network parameters using the following procedure.

(a) Set the "No. of boards in module" for which the network parameters are to be set.

Default value: None
Setting range: 0 to 4 (Boards)*
* Modules for the parameter setting with the RLPASET instruction should not be included in the setting for "No. of boards in module".

Example) Set 1 (Board).

(b) Set the "Start I/O No." for the master station.

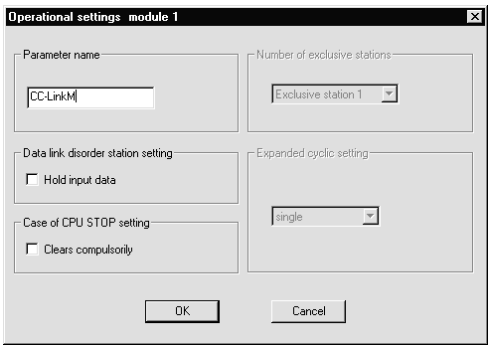
Default value: None
Setting range: 0000 to 0FE0

Example) Set 0000.

(c) Set the Parameter name using "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None
Setting range: 8 characters or less

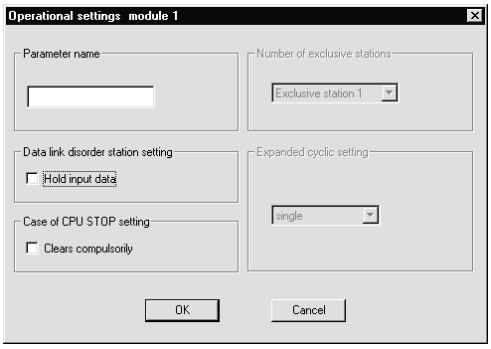
Example) Set "CC-LinkM".




(d) Set the input status for the data link error station using "Operational settings".

Default value: Clear ("Hold input data" not checked)
Setting range: Hold ("Hold input data" checked)
Clear ("Hold input data" not checked)

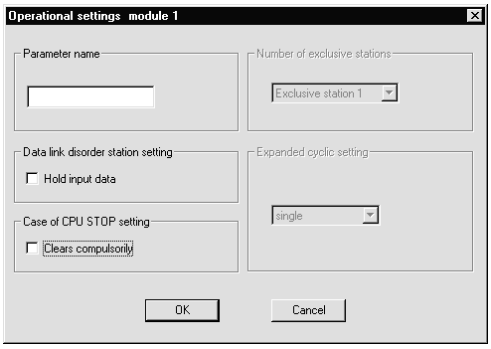
Example) Set to Clear ("Hold input data" not checked).




(f) Set the slave station refresh/compulsory clear setting at PLC CPU STOP using "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)
Setting range: Refresh ("Clears compulsorily " not checked)
Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).



(f) Set the station type using "Type".

Default value: Master station
Setting range: Master station
Master station (Duplex function)
Local station
Standby master station

Example) Set to Master station.

(g) Set the CC-Link mode using "Mode".

Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line

Example) Set to Remote I/O net mode.

(h) Set the data link status using "PLC down select", when a master station PLC CPU error occurs.

Default value: Stop
Setting range: Stop
Continue

Example) Set to Stop.

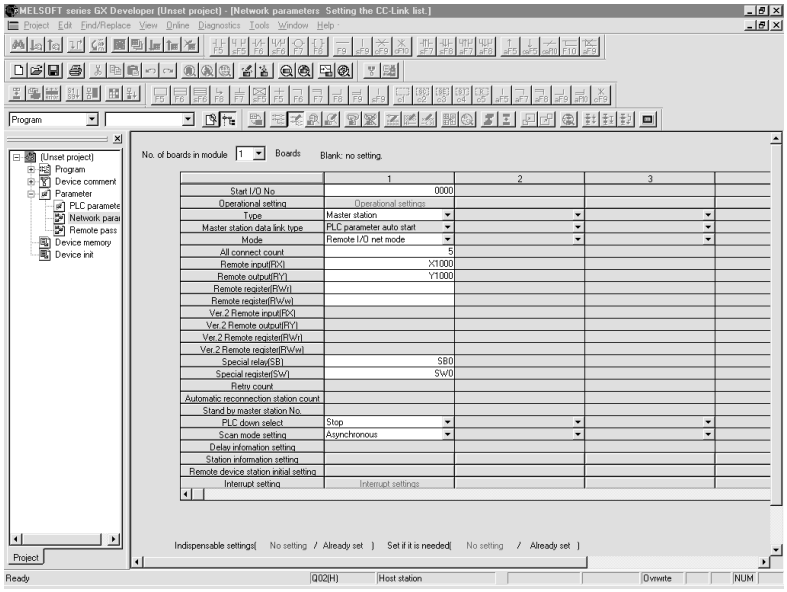
(i) Set whether the link scan for the sequence scan is synchronous or asynchronous using "Scan mode setting".

Default value: Asynchronous
Setting range: Asynchronous
Synchronous

Example) Set to Asynchronous.

## 6.6.2 Master station automatic refresh parameter settings

(1) The following shows an example of the parameter settings. See (2) for actual settings.


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list.]
No. of boards in module 1 Boards Blank: no setting.
Start I/O No. 0000
Operational setting Operational settings
Type Master station
Master station data link type PLC parameter auto start
Mode Remote I/O net mode
All connect count 5
Remote input(RX) X1000
Remote output(RY) Y1000
Special relay(SB) SB0
Special register(SW) SW0
PLC down select Stop
Scan mode setting Asynchronous
Interrupt setting Interrupt settings
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
Ready
Q02(H)
Host station

(2) Set the automatic refresh parameters using the following procedure.

(a) Set the remote input (RX) refresh device using "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

(b) Set the remote output (RY) refresh device using "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

(c) Set the special relay (SB) refresh device using "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

(d) Set the special register (SW) refresh device using "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

Device number - Within the range of the device points that the CPU has.

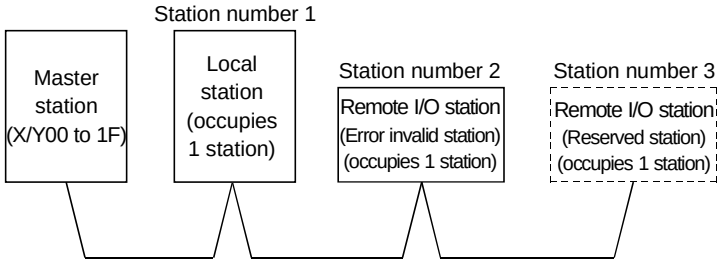
Example) Set to SW0.

| POINT |
| --- |
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |


6 - 47

## 6.7 Example of Parameter Setting with Dedicated Instruction

This section explains the parameter setting with the RLPASET instruction. For more details on the GX Developer operation, refer to the GX Developer Operational Manual. The explanations in this section are based on the following example of the system configuration.

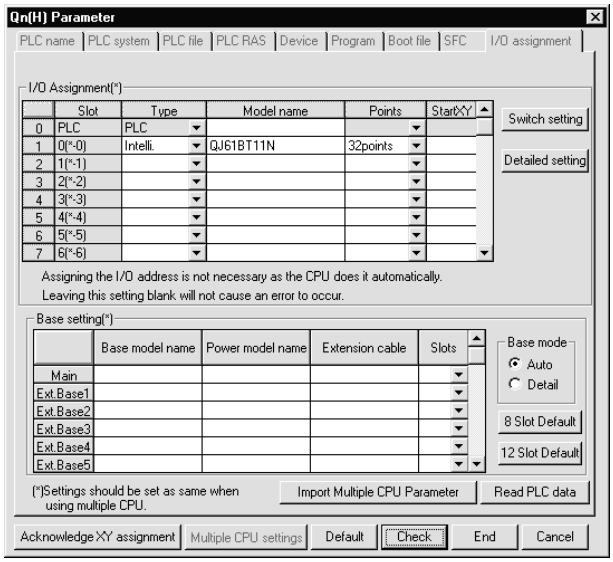

Station number 1
Master station (X/Y00 to 1F)
Local station (occupies 1 station)
Station number 2
Remote I/O station (Error invalid station) (occupies 1 station)
Station number 3
Remote I/O station (Reserved station) (occupies 1 station)

**POINT**

Do not use GX Developer for setting the network parameters, if the network parameters of all the modules are set by the RLPASET instruction.
Change the "No. of boards in module" setting to blank if the network parameters have been already set by GX Developer.
Moreover, in case a system includes both a module for which the network parameters are set by GX Developer and a module for which the network parameters are set by the RLPASET instruction, the module for which the network parameters are set by the RLPASET instruction should not be included in the "No. of boards in module" setting of GX Developer.


6 - 48

### (1) PLC parameter setting




(a) I/O assignment setting screen

Set the following for the slot in which the master module is mounted.

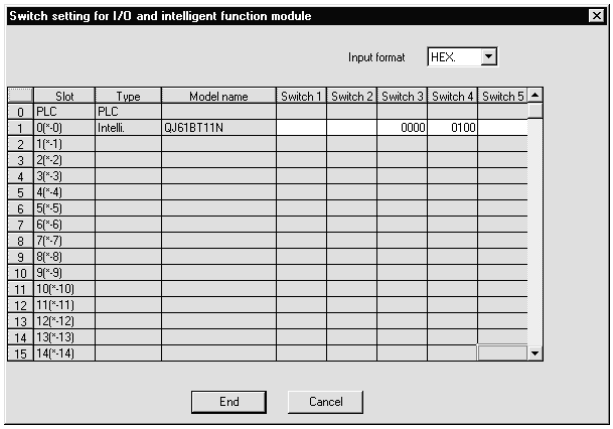
The type setting is required; set other items as needed.

Type : Select "intelli."

Model name : Enter the module model name.

Points : Select 32 points

Start XY : Enter the start I/O number for the master module.




(b) Intelligent function module switch setting

Click the Switch Setting button in the I/O assignment setting screen to display the screen shown to the left.

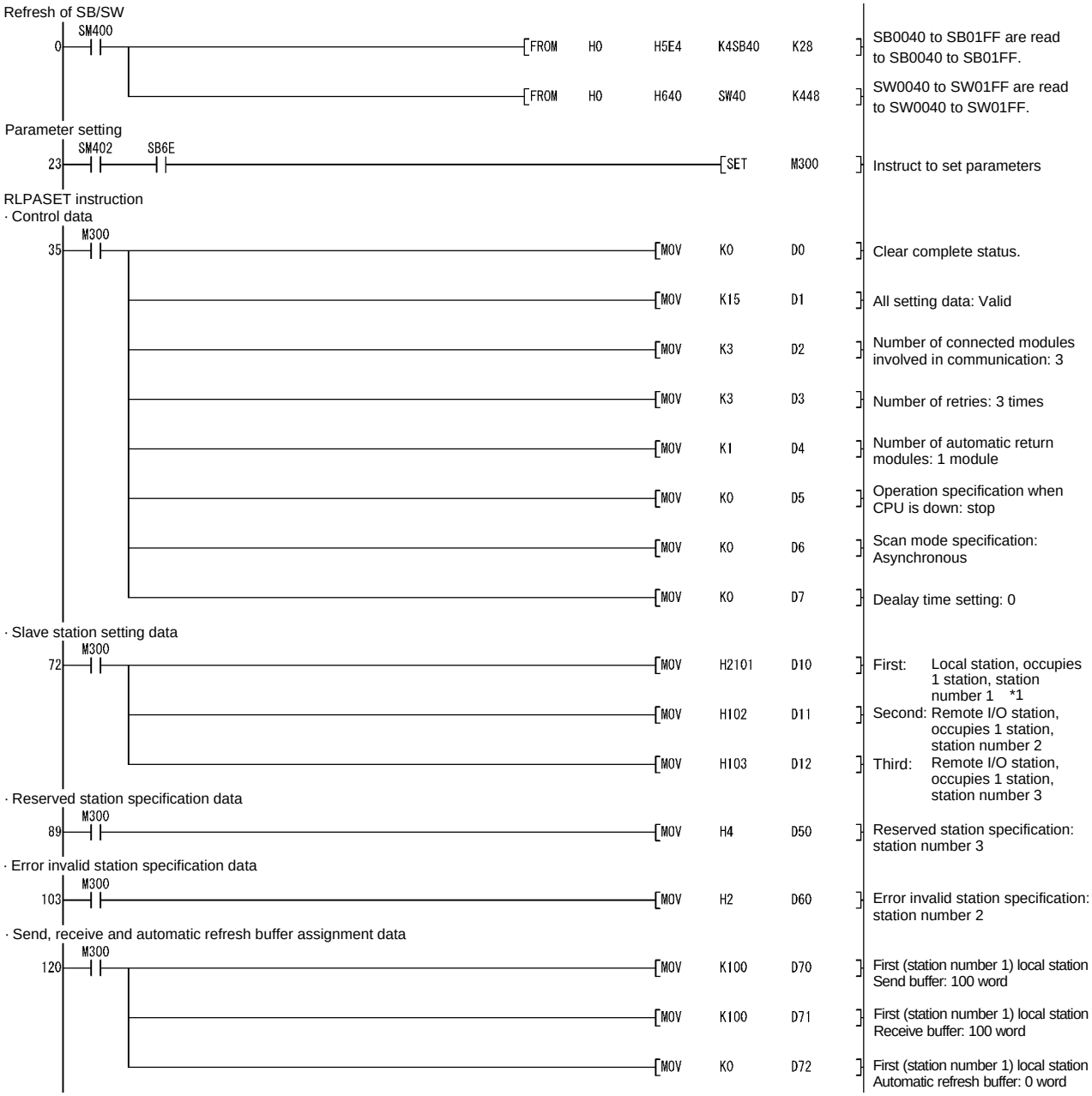
Set the input format to hexadecimal and enter values for switches 3, 4. The switch settings are indicated in the following table.

* If switches 3, 4 have not been set or the settings are not as indicated in the following table, the RLPASET instruction is completed with an error.
  In this case, the QJ61BT11N with the smallest start I/O number seen from the PLC CPU starts CC-Link automatically.
  Do not make any settings for other than switches 3, 4.
  Normal operation cannot be guaranteed if settings other than for switch 4 are made.

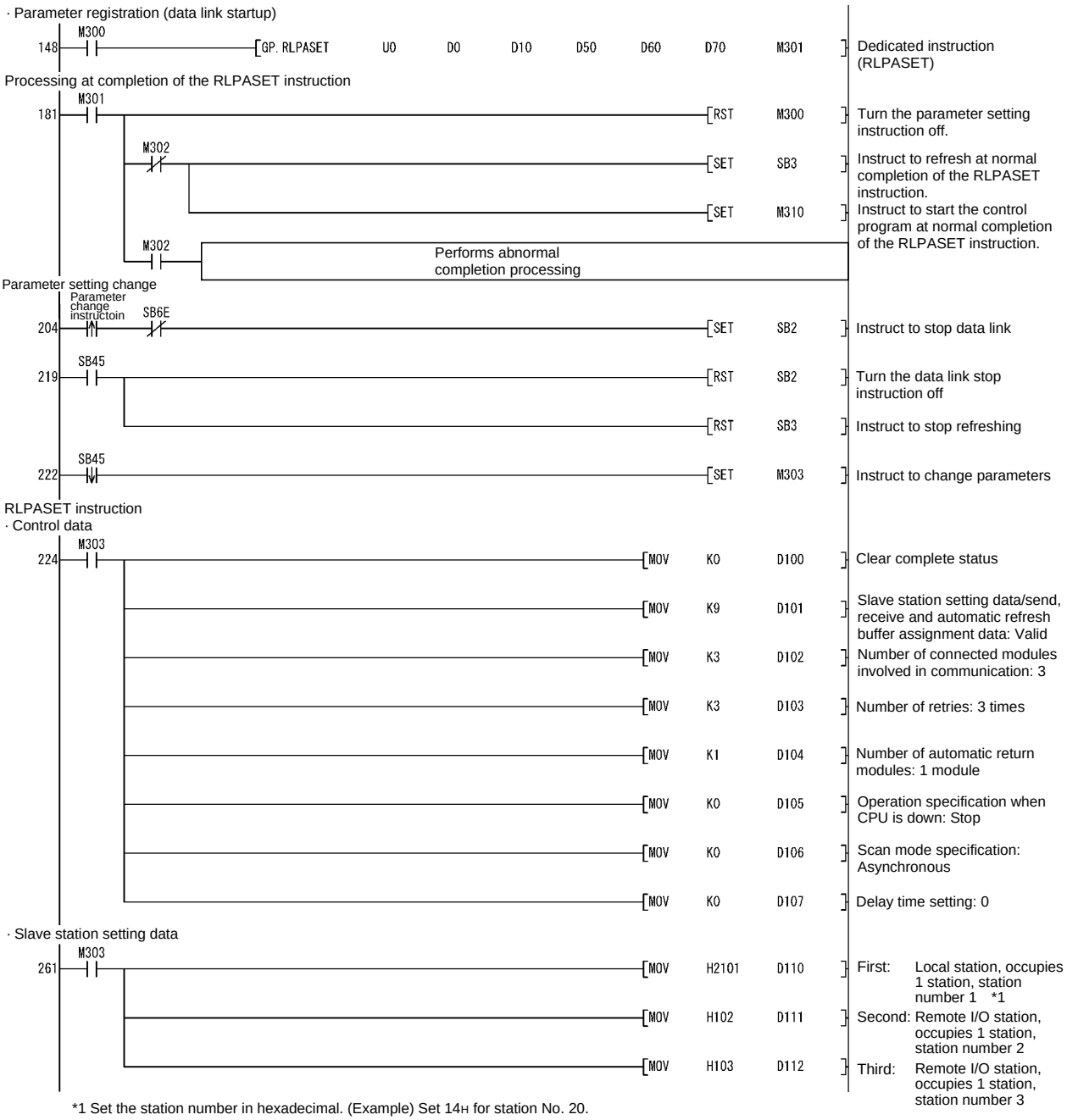
| Mode | Switch 1 | Switch 2 | Switch 3 | Switch 4 | Switch 5 |
|---|---|---|---|---|---|
| Remote net ver.2 mode | | | 0200 | 0100 | |
| Remote net additional mode | | | 0100 | 0100 | |
| Remote net ver.1 mode | | | 0000 or blank | 0100 | |


6 - 49

## (2) Program example

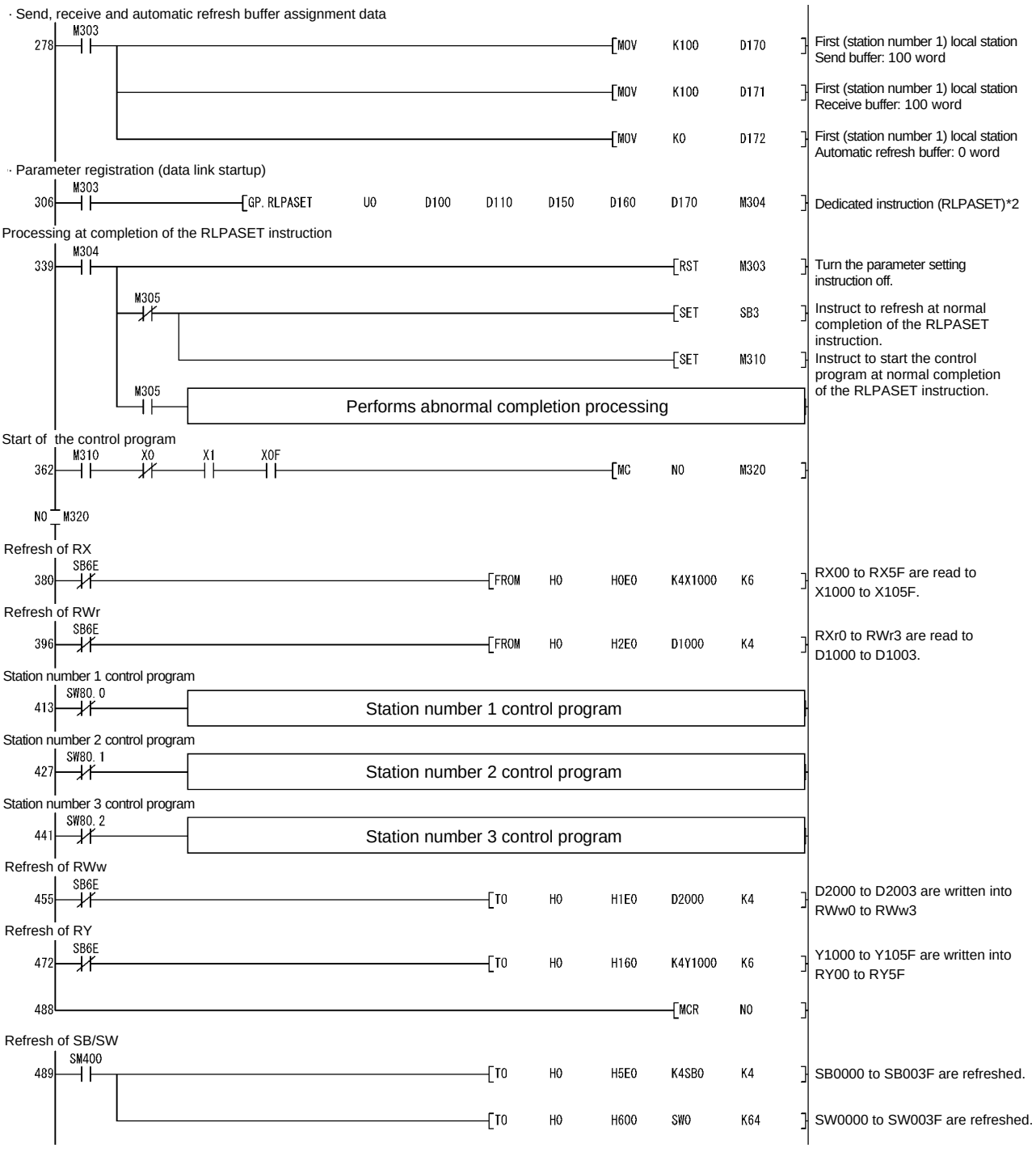

Refresh of SB/SW
SM400
0
FROM H0 H5E4 K4SB40 K28
SB0040 to SB01FF are read to SB0040 to SB01FF.
FROM H0 H640 SW40 K448
SW0040 to SW01FF are read to SW0040 to SW01FF.
Parameter setting
SM402 SB6E
23
SET M300
Instruct to set parameters
RLPASET instruction
· Control data
M300
35
MOV K0 D0
Clear complete status.
MOV K15 D1
All setting data: Valid
MOV K3 D2
Number of connected modules involved in communication: 3
MOV K3 D3
Number of retries: 3 times
MOV K1 D4
Number of automatic return modules: 1 module
MOV K0 D5
Operation specification when CPU is down: stop
MOV K0 D6
Scan mode specification: Asynchronous
MOV K0 D7
Dealay time setting: 0
· Slave station setting data
M300
72
MOV H2101 D10
First: Local station, occupies 1 station, station number 1 *1
MOV H102 D11
Second: Remote I/O station, occupies 1 station, station number 2
MOV H103 D12
Third: Remote I/O station, occupies 1 station, station number 3
· Reserved station specification data
M300
89
MOV H4 D50
Reserved station specification: station number 3
· Error invalid station specification data
M300
103
MOV H2 D60
Error invalid station specification: station number 2
· Send, receive and automatic refresh buffer assignment data
M300
120
MOV K100 D70
First (station number 1) local station Send buffer: 100 word
MOV K100 D71
First (station number 1) local station Receive buffer: 100 word
MOV K0 D72
First (station number 1) local station Automatic refresh buffer: 0 word

*1 Set the station number in hexadecimal. (Example) Set 14H for station No. 20.




*1 Set the station number in hexadecimal. (Example) Set 14H for station No. 20.


6 - 51



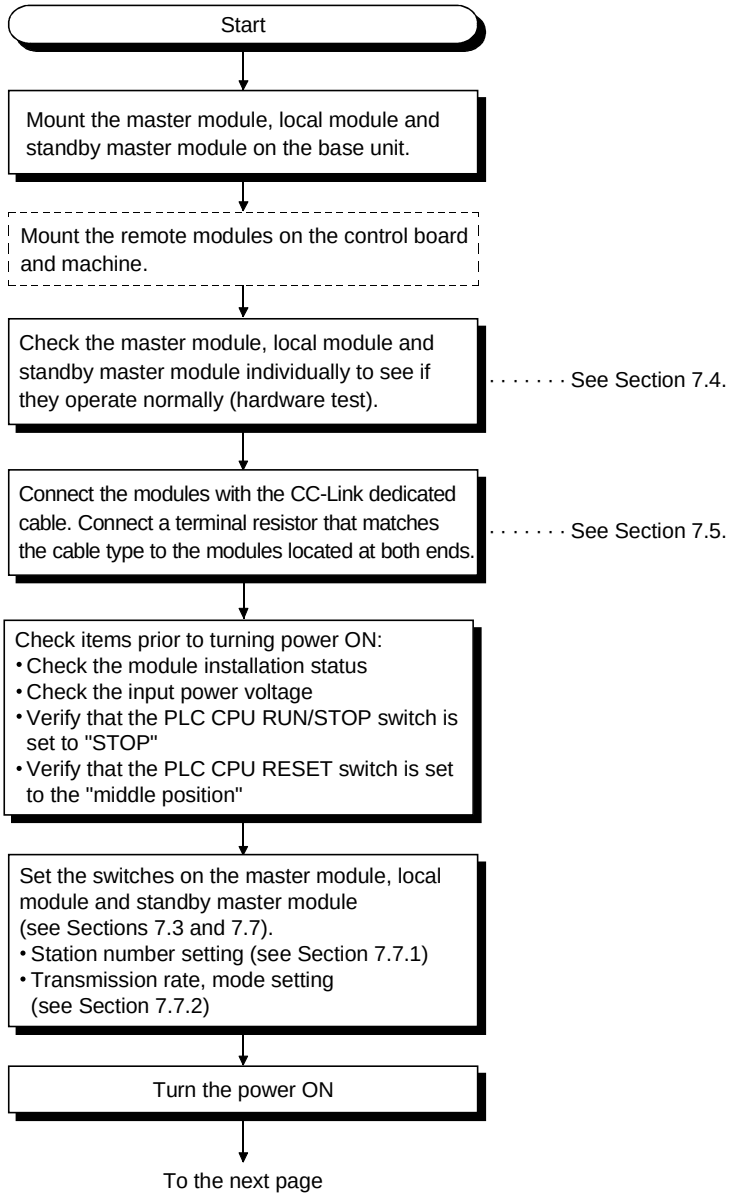

*2 D150 and D160 are dummy devices.

# 7 PROCEDURE BEFORE STARTING THE DATA LINK

This chapter explains the procedure from the module installation to the data link startup.

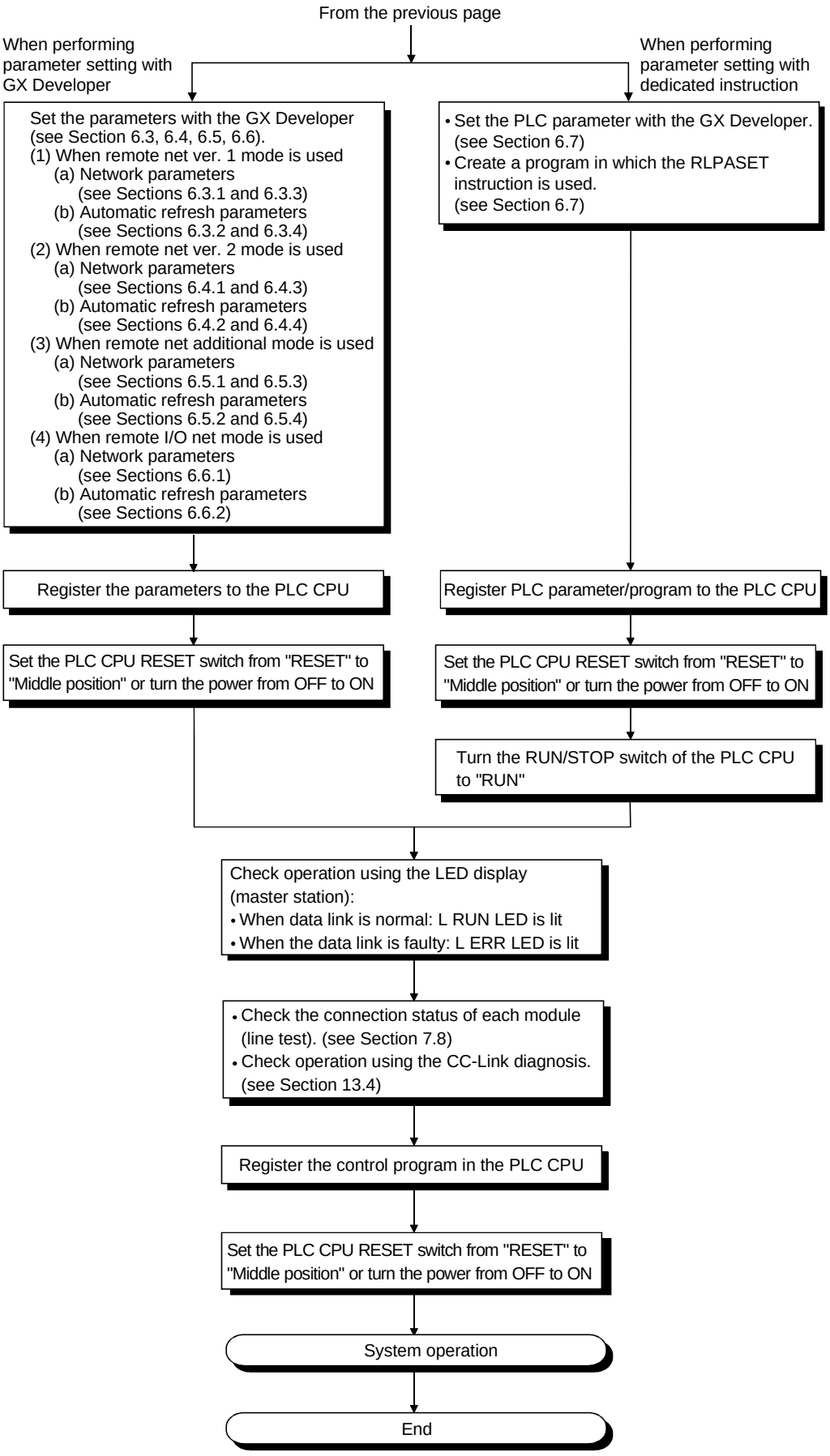
## 7.1 Procedure Before Starting the Data Link

The following describes the procedure from the module installation to the CC-Link data link startup.


Start
Mount the master module, local module and standby master module on the base unit.
Mount the remote modules on the control board and machine.
Check the master module, local module and standby master module individually to see if they operate normally (hardware test).
See Section 7.4.
Connect the modules with the CC-Link dedicated cable. Connect a terminal resistor that matches the cable type to the modules located at both ends.
See Section 7.5.
Check items prior to turning power ON:
• Check the module installation status
• Check the input power voltage
• Verify that the PLC CPU RUN/STOP switch is set to "STOP"
• Verify that the PLC CPU RESET switch is set to the "middle position"
Set the switches on the master module, local module and standby master module (see Sections 7.3 and 7.7).
• Station number setting (see Section 7.7.1)
• Transmission rate, mode setting (see Section 7.7.2)
Turn the power ON
To the next page




7 - 1


From the previous page
When performing parameter setting with GX Developer
When performing parameter setting with dedicated instruction
Set the parameters with the GX Developer (see Section 6.3, 6.4, 6.5, 6.6).
(1) When remote net ver. 1 mode is used
(a) Network parameters (see Sections 6.3.1 and 6.3.3)
(b) Automatic refresh parameters (see Sections 6.3.2 and 6.3.4)
(2) When remote net ver. 2 mode is used
(a) Network parameters (see Sections 6.4.1 and 6.4.3)
(b) Automatic refresh parameters (see Sections 6.4.2 and 6.4.4)
(3) When remote net additional mode is used
(a) Network parameters (see Sections 6.5.1 and 6.5.3)
(b) Automatic refresh parameters (see Sections 6.5.2 and 6.5.4)
(4) When remote I/O net mode is used
(a) Network parameters (see Sections 6.6.1)
(b) Automatic refresh parameters (see Sections 6.6.2)
• Set the PLC parameter with the GX Developer. (see Section 6.7)
• Create a program in which the RLPASET instruction is used. (see Section 6.7)
Register the parameters to the PLC CPU
Register PLC parameter/program to the PLC CPU
Set the PLC CPU RESET switch from "RESET" to "Middle position" or turn the power from OFF to ON
Set the PLC CPU RESET switch from "RESET" to "Middle position" or turn the power from OFF to ON
Turn the RUN/STOP switch of the PLC CPU to "RUN"
Check operation using the LED display (master station):
• When data link is normal: L RUN LED is lit
• When the data link is faulty: L ERR LED is lit
• Check the connection status of each module (line test). (see Section 7.8)
• Check operation using the CC-Link diagnosis. (see Section 13.4)
Register the control program in the PLC CPU
Set the PLC CPU RESET switch from "RESET" to "Middle position" or turn the power from OFF to ON
System operation
End




7 - 2

## 7.2 Installation

The following section explains the precautions when handling the master and local modules, from the time they are unpacked until they are installed.
For more details on the module installation, see the user's manual for the PLC CPU used.

### 7.2.1 Handling precautions

(1) Do not drop the module case or subject it to heavy impact since it is made of resin.

(2) Do not remove the PCB of each module from its case. This may cause a failure in the module.

(3) Be careful not to let foreign objects such as wire burrs enter the module during wiring. In the event any foreign object enters, remove it immediately.

(4) The top surface of the module is covered with a protective film to prevent foreign objects such as wire burrs from entering the module during wiring. Do not remove this film until the wiring is complete. Before operating the system, be sure to remove the film to provide adequate heat ventilation.

(5) Solderless terminals with insulation sleeve cannot be used for the terminal block. It is recommended that the wiring connecting sections of the solderless terminals will be covered with a marking tube or an insulation tube.

(6) Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the module.
Failure to do so may cause a failure or malfunctions of the module.

(7) Tighten the module mounting screws and terminal screws using torque within the following ranges.

| Screw location | Tightening torque range |
|---|---|
| Module mounting screws (M3 screws) | 0.36 to 0.48 N · m |
| Terminal block screws (M3 screws) | 0.42 to 0.58 N · m |
| Terminal block mounting screws (M3.5 screws) | 0.66 to 0.89 N · m |

(8) To mount the module on the base unit, fully insert the module fixing latch into the fixing hole in the base unit and press the module using the hole as a fulcrum. Improper installation may result in a module malfunction, or may cause the module to fall off.

**POINT**

(1) Be sure to turn off the power supply to the applicable station before installing or removing the terminal block.
If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.

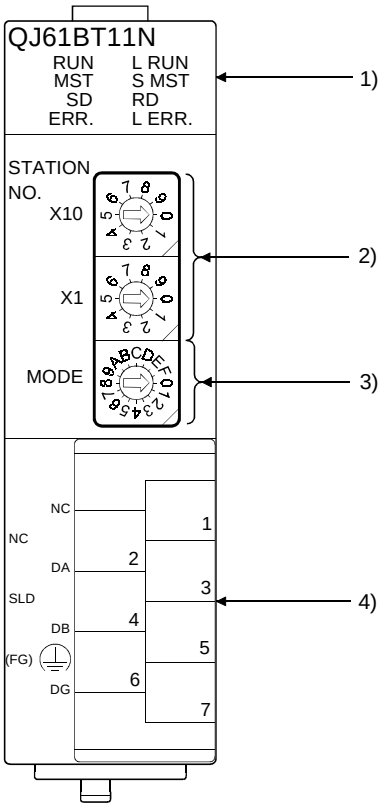
(2) Always make sure to power off the system in advance when removing the terminating resistor to charge the system. If the terminating resistor is removed and mounted while the system is energized, normal data transmission will not be guaranteed

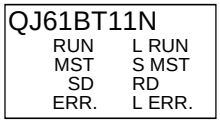
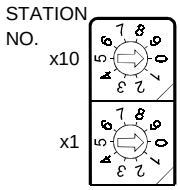
## 7.2.2 Installation environment

For further details, see the user's manual for the PLC CPU used.

## 7.3 Part Identification Nomenclature and Settings

The following section describes the parts names of the master and local modules, and the contents of the LED display and switch settings.

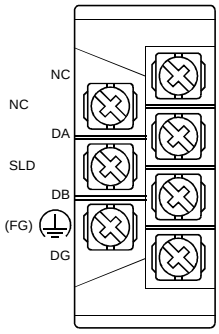


<table>
<tr><th>Number</th><th>Name</th><th colspan="2">Description</th></tr>
<tr><td rowspan="9">1)</td><td rowspan="9">LED display<br>  <br></td><td colspan="2">Verify the data link status with the LED ON/OFF.</td></tr>
<tr><td>LED name</td><td>Description</td></tr>
<tr><td>RUN</td><td>On : When the module is operating normally<br>Off : When a watchdog timer error occurs</td></tr>
<tr><td>ERR.</td><td>On: All stations have a communication error<br>Also lights up when the following errors occur.<br>• Switch type setting is incorrect<br>• There are more than one master station on the same line<br>• There is an error in the parameter contents<br>• The data link monitoring timer was activated<br>• The cable is disconnected<br>Or, the transmission path is affected by noise.<br>To check the source of the error, see Section 13.4.<br>Or, see Section 8.4.2 for details regarding SW0058 (detailed LED display status)<br>Flashing: A communication error station identified, or remote station No. duplicated.</td></tr>
<tr><td>MST</td><td>On: Operating as a master station (during data link control)</td></tr>
<tr><td>S MST</td><td>On: Operating as a standby master station (during standby)</td></tr>
<tr><td>L RUN</td><td>On: Data link is being executed</td></tr>
<tr><td>L ERR.</td><td>On : Communication error (host)<br>Flashing at fixed intervals: The settings of switches 2) and 3) were changed while the power is on.<br>Flashing at inconsistent intervals: The terminal resistor is not attached. The module and CC-Link dedicated cable are affected by noise.</td></tr>
<tr><td>SD</td><td>On: During data sending</td></tr>
<tr><td>RD</td><td>On: During data receiving</td></tr>
<tr><td>2)</td><td>Station number setting switches<br>  <br></td><td colspan="2">Set the module station number (setting at the time of shipment: 0)<br><Setting range><br>Master station : 0<br>Local station : 1 to 64<br>Standby master station : 1 to 64<br>If a number other than 0 to 64 is set, the "ERR." LED lights up.</td></tr>
</table>

"MST" and "S MST" LED indicator lamp status and station types

| Type of station set | Operation status | |
|---|---|---|
| | Operating as a master station (controlling data link) | Operating as a standby master station (standing by) |
| Master station | MST ✱ ○ S MST | MST ○ ✱ S MST |
| Standby master station | MST ✱ ○ S MST | MST ○ ✱ S MST |
| Local station | ——— | ——— |

✱ : On, ○ : Off

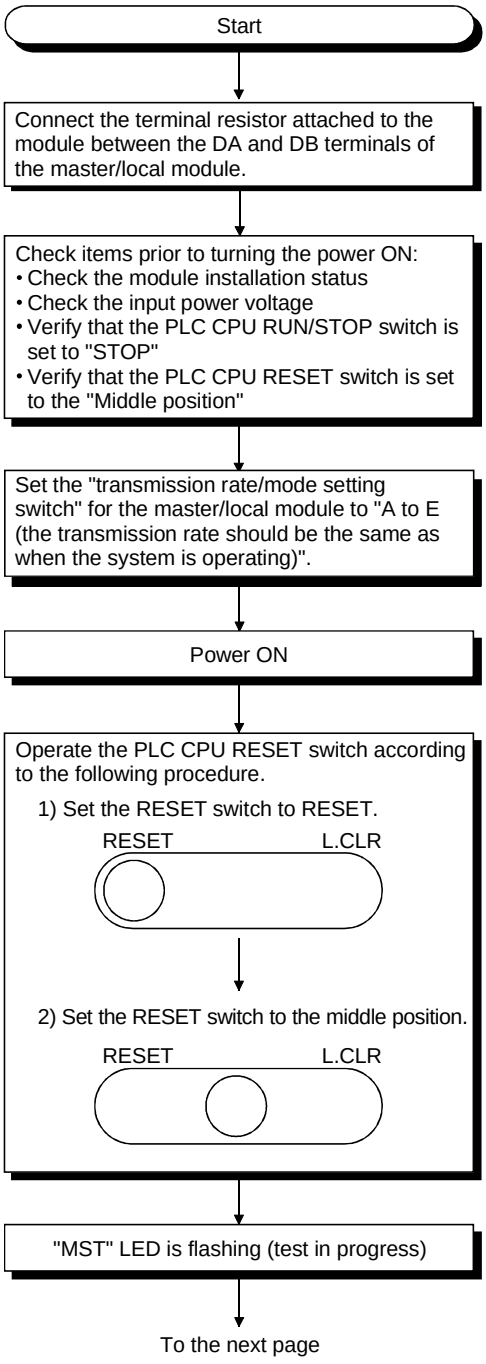
<table>
<tr><th>Number</th><th>Name</th><th colspan="3">Description</th></tr>
<tr><td>3)</td><td>Transmission rate/mode setting switch<br><br>MODE </td><td colspan="3">Set the transmission rate and operating conditions for the module (settings at time of shipment: 0)<br><table>
<tr><th>Number</th><th>Transmission rate settings</th><th>Mode</th></tr>
<tr><td>0</td><td>Transmission rate 156 kbps</td><td rowspan="5">Online<br>(see Section 7.7.2)</td></tr>
<tr><td>1</td><td>Transmission rate 625 kbps</td></tr>
<tr><td>2</td><td>Transmission rate 2.5 Mbps</td></tr>
<tr><td>3</td><td>Transmission rate 5 Mbps</td></tr>
<tr><td>4</td><td>Transmission rate 10 Mbps</td></tr>
<tr><td>5</td><td>Transmission rate 156 kbps</td><td rowspan="5">Line test (see Section 7.8)<br>When the station number setting switch is set to 0: Line test 1<br>When the station number setting switch is set to 1 to 64: Line test 2</td></tr>
<tr><td>6</td><td>Transmission rate 625 kbps</td></tr>
<tr><td>7</td><td>Transmission rate 2.5 Mbps</td></tr>
<tr><td>8</td><td>Transmission rate 5 Mbps</td></tr>
<tr><td>9</td><td>Transmission rate 10 Mbps</td></tr>
<tr><td>A</td><td>Transmission rate 156 kbps</td><td rowspan="5">Hardware test<br>(see Section 7.4)</td></tr>
<tr><td>B</td><td>Transmission rate 625 kbps</td></tr>
<tr><td>C</td><td>Transmission rate 2.5 Mbps</td></tr>
<tr><td>D</td><td>Transmission rate 5 Mbps</td></tr>
<tr><td>E</td><td>Transmission rate 10 Mbps</td></tr>
<tr><td>F</td><td colspan="2">Setting not allowed</td></tr>
</table></td></tr>
<tr><td>4)</td><td>Terminal block<br>  <br></td><td colspan="3">Connect the CC-Link dedicated cable for data linking.<br>For the connection method, see Section 7.5.<br><br>Terminals SLD and FG are connected inside the module.<br>Since a 2-piece type terminal block is used, the module can be replaced without disconnecting the signal line to the terminal block.<br>(Replace the module after turning its power OFF.)</td></tr>
</table>

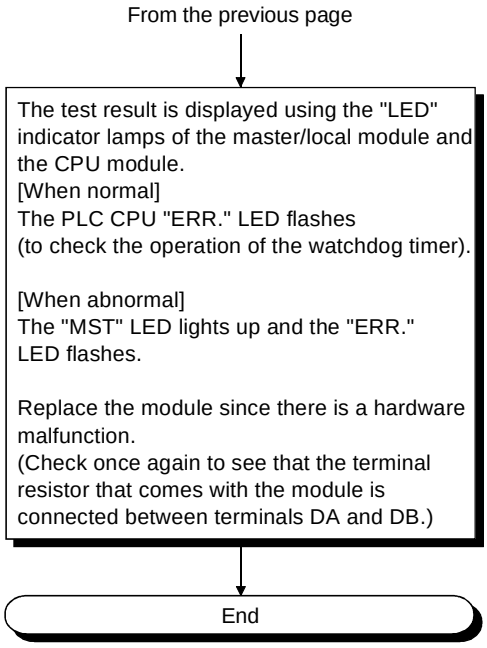
| POINT |
|---|
| The settings of the station number setting switch and the transmission rate/mode setting switch become valid when the module power is turned from OFF to ON or the PLC CPU is reset. Thus, if the settings were changed while the module power was ON, turn the module power from OFF to ON or reset the PLC CPU again. |

## 7.4 Checking the Module Status (Hardware Test)

The hardware test checks whether or not each module works properly by itself. Always perform this hardware test before configuring the system and for each module by itself without connecting the cable. Otherwise, the hardware test will not be executed properly.

Execute the hardware test using the following procedure.


Start
Connect the terminal resistor attached to the module between the DA and DB terminals of the master/local module.
Check items prior to turning the power ON:
• Check the module installation status
• Check the input power voltage
• Verify that the PLC CPU RUN/STOP switch is set to "STOP"
• Verify that the PLC CPU RESET switch is set to the "Middle position"
Set the "transmission rate/mode setting switch" for the master/local module to "A to E (the transmission rate should be the same as when the system is operating)".
Power ON
Operate the PLC CPU RESET switch according to the following procedure.
1) Set the RESET switch to RESET.
RESET
L.CLR
2) Set the RESET switch to the middle position.
RESET
L.CLR
"MST" LED is flashing (test in progress)
To the next page


From the previous page
The test result is displayed using the "LED" indicator lamps of the master/local module and the CPU module.
[When normal]
The PLC CPU "ERR." LED flashes
(to check the operation of the watchdog timer).
[When abnormal]
The "MST" LED lights up and the "ERR." LED flashes.
Replace the module since there is a hardware malfunction.
(Check once again to see that the terminal resistor that comes with the module is connected between terminals DA and DB.)
End

**POINT**

When the RUN/STOP switch of the PLC CPU is set to "RUN" and a hardware test is performed, the system status become SP. UNIT DOWN and the PLC CPU stops to check the operation of the watch dog timer function. Make sure that the RUN/STOP switch of the PLC CPU is set to "STOP" and then perform the hardware test.

## 7.5 Connecting the Modules Using the CC-Link Dedicated Cables

This section explains how to connect the master module, local modules, standby master module, remote modules and intelligent device modules with the CC-Link dedicated cables.

(1) CC-Link cables can be connected from any station number.

(2) Connect the supplied "terminal resistors" to each module at both ends of the CC-Link system.
Connect the terminal resistors between "DA" and "DB".
There are restrictions on the case where the A(1S)J61BT11/A(1S)J61QBT11 is used as the master station in a T-branch system configuration. Refer to Section 7.6.1 for details.

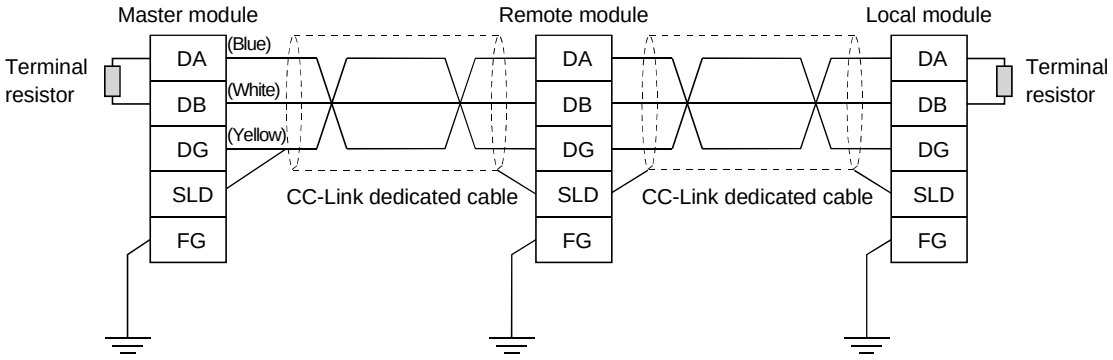
(3) The terminal resistors to be connected vary depending on the types of cables used in the CC-Link system.

| Cable type | Terminal resister |
|---|---|
| CC-Link dedicated cable | 110 Ω 1/2 W (brown - brown – brown) |
| Version 1.10 compatible CC-Link dedicated cable | |
| CC-Link dedicated high-performance cable | 130 Ω 1/2 W (brown - orange – brown) |

(4) The master module can be connected at points other than both ends.

(5) Star connection is not allowed.

(6) The connection method is shown below.




**IMPORTANT**

CC-Link dedicated high-performance cables cannot be used with other cables such as CC-Link dedicated cables or Ver.1.10 compatible CC-Link dedicated cables. If used together, correct data transmission will not be guaranteed.

**POINT**

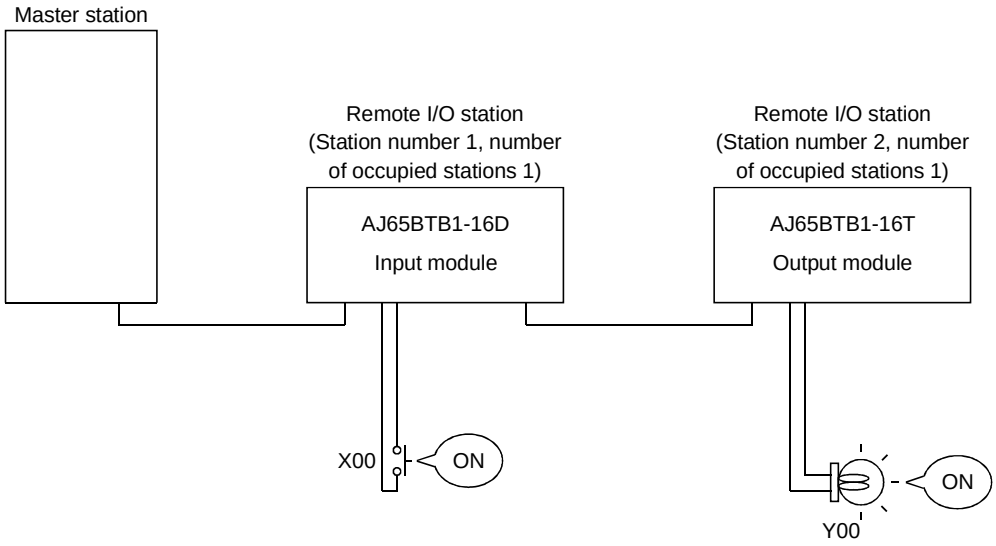
Connect the shielded wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the shielded wire using D type grounding via "FG".
The SLD and FG are connected within the module.

## 7.5.1 Wiring check

The following explains how to check the wiring status between the remote I/O and external devices.

### [Example of wiring check]

Specify the "Remote input (RX)" for the master station to "X1000" and the "Remote output (RY)" to "Y1000" with the GX Developer.




(a) Checking the wiring between the input module and an external device

1) Turn ON the switch corresponding to the external device "X0," which is connected to the input module of station number 1.
2) Using the GX Developer, set "X1000" in the "Device:" field by choosing "Online" - "Monitor" - "Device batch" and then click on "Start monitor".
3) If X1000 is ON, the connection between the input module and external device has been properly performed.

(b) Checking the wiring between the output module and an external device

1) Using the GX Developer, set "Y1000" in the "Device:" field for the "Bit device" by choosing "Online" - "Debug" - "Device test" and then click on "FORCE ON".
2) If the connection between the output module and external device is properly performed, the indicator lamp corresponding to the external device "Y00" is lit.

**POINT**

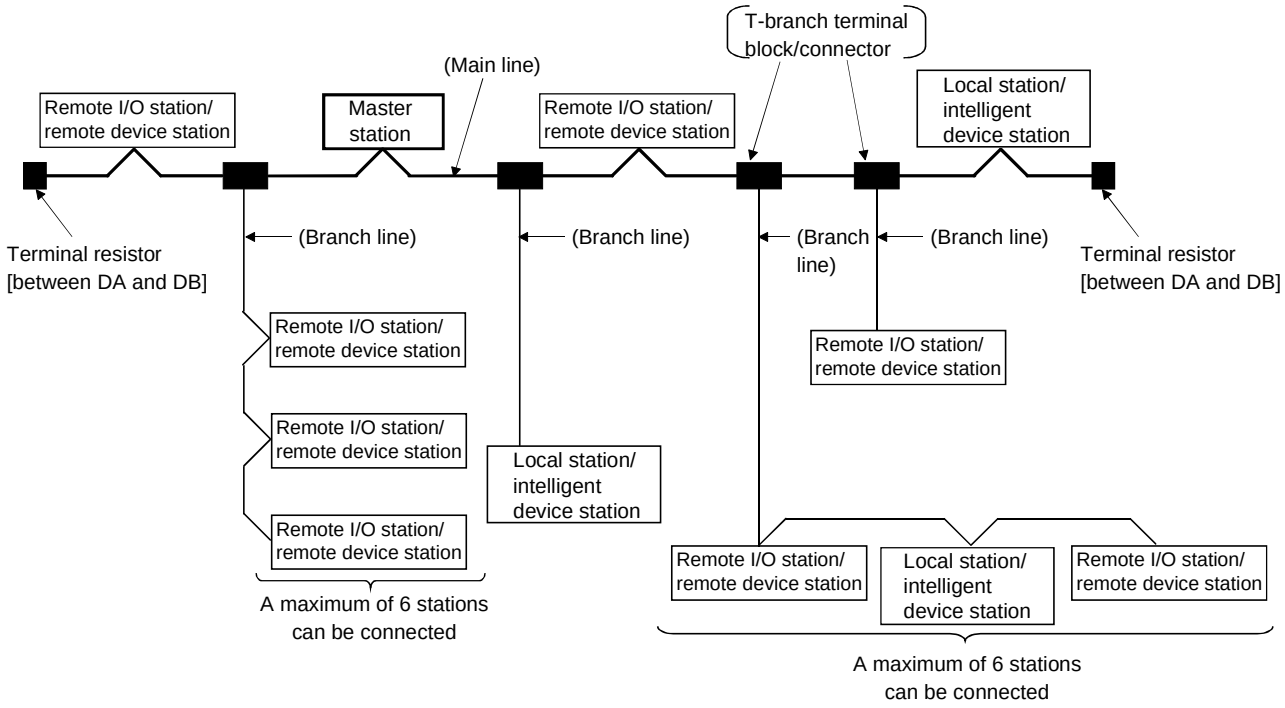
If X corresponding to the switch does not turn on or the lamp corresponding to Y does not turn on, confirm the slave station offset, size information (buffer memory address 3E0H, Un\G992) to check the RX/RY/RWw/RWr assignment status of the module.

## 7.6 T-Branch Connection with the CC-Link Dedicated Cable

This section explains how to perform a T-branch connection using the CC-Link dedicated cable.

### 7.6.1 T-Branch system configuration

The following shows a system configuration using T-branch connection.

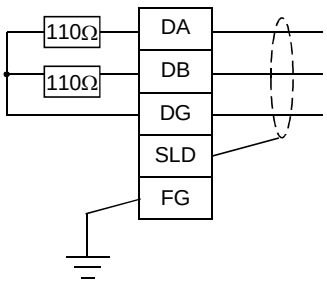

T-branch terminal block/connector
(Main line)
Remote I/O station/ remote device station
Master station
Remote I/O station/ remote device station
Local station/ intelligent device station
Terminal resistor [between DA and DB]
(Branch line)
(Branch line)
(Branch line)
(Branch line)
Terminal resistor [between DA and DB]
Remote I/O station/ remote device station
Remote I/O station/ remote device station
Remote I/O station/ remote device station
Local station/ intelligent device station
Remote I/O station/ remote device station
A maximum of 6 stations can be connected
Remote I/O station/ remote device station
Local station/ intelligent device station
Remote I/O station/ remote device station
A maximum of 6 stations can be connected

✻ The number of branch lines is determined by the branch line length per branch line and the overall branch line length.

When the model name and hardware version of the master module are as indicated below in a T-branch system configuration, change the terminating resistor connection method as described below.
When using the other master module, connect the terminating resistor packed with the product.

AJ61BT11 : Hardware version C or earlier
AJ61QBT11 : Hardware version C or earlier
A1SJ61BT11 : Hardware version D or earlier
A1SJ61QBT11 : Hardware version D or earlier

[Connection]




110 Ω ± 5 %, 1/2W × 4
(Connect between DA and DG/DB and DG) … both ends

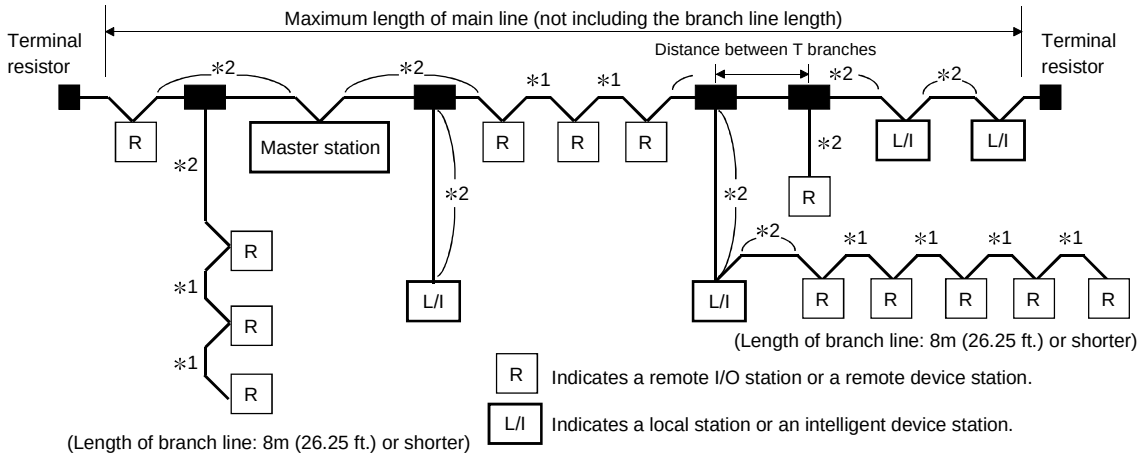
Use a commercially available terminal resistor of 110 Ω ± 5% and 1/2 W resistance.

110 Ω and 130 Ω resistors that are supplied with the master/local modules cannot be used.

## 7.6.2 T-Branch communication specifications list

The following describes the communication specifications for T branch connection.
For communication specifications not listed below, see Section 3.1.

<table>
<tr><th>Item</th><th colspan="2">Specification</th><th>Remarks</th></tr>
<tr><td>Transmission rate</td><td>625 kbps</td><td>156 kbps</td><td>10 M/5 M/2.5 Mbps are not allowed.</td></tr>
<tr><td>Maximum length of the main line</td><td>100 m<br>(328.1 ft.)</td><td>500 m<br>(1640.5 ft.)</td><td>Indicates the length of the cable between terminal resistors. The length of the T branch cable (branch line length) is not included.</td></tr>
<tr><td>Maximum length of the branch line</td><td colspan="2">8 m (26.25 ft.)</td><td>Indicates the overall cable length per branch.</td></tr>
<tr><td>Overall branch line length</td><td>50 m (164.05 ft.)</td><td>200 m (656.2 ft.)</td><td>Indicates the overall length of the entire branch cable.</td></tr>
<tr><td>Maximum number of connected stations on the branch line</td><td colspan="2">6 stations per branch</td><td>The total number of connected stations depends on the CC-Link specifications.</td></tr>
<tr><td>Connection cable</td><td colspan="2">CC-Link dedicated cable<br>Ver. 1.10 compatible CC-Link dedicated cable</td><td>• The CC-Link dedicated high-performance cable cannot be used.<br>• Mixing of different brands of CC-Link dedicated cables is not allowed.<br>• Mixing of different brands of Ver. 1.10 compatible CC-Link dedicated cables is allowed.</td></tr>
<tr><td>T branch terminal block/connector</td><td colspan="2">• Terminal block: Off-the-shelf terminal block<br>• Connector: Connector for the FA sensor (ICE947-5-2) comparable product is recommended</td><td>• When wiring cables for the main line side, try not to remove the covering as much as possible.</td></tr>
<tr><td>Maximum length of main line, distance between T branches, and length of cable between stations</td><td colspan="3">CC-Link dedicated cable, Ver.1.10 compatible CC-Link dedicated cable (uses 110 Ω terminal resistor)
<table>
<tr><th>Transmission rate</th><th>Maximum length of main line</th><th>Distance between T branches</th><th>Length of cable between the remote I/O stations or remote device stations ＊1</th><th>Length of cable between the master/local station or intelligent device station and the adjacent station(s) ＊2</th></tr>
<tr><td>625 kbps</td><td>100 m (328.1 ft.)</td><td rowspan="2">No limit</td><td rowspan="2">30 cm (11.8 in.) or longer</td><td rowspan="2">1 m (3.28 ft.) or longer (＊3)/<br>2 m (6.56 ft.) or longer (＊4)</td></tr>
<tr><td>156 kbps</td><td>500 m (1640.5 ft.)</td></tr>
</table>
＊3: The cable length of 1m (3.28 ft.) or longer is for a system configured only with remote I/O stations and remote device stations.<br>＊4: The cable length of 2m (6.56 ft.) or longer is for a system configuration that contains local stations and intelligent device stations.</td></tr>
</table>


Maximum length of main line (not including the branch line length)
Terminal resistor
Distance between T branches
Terminal resistor
Master station
R
L/I
＊1
＊2
(Length of branch line: 8m (26.25 ft.) or shorter)
(Length of branch line: 8m (26.25 ft.) or shorter)
R Indicates a remote I/O station or a remote device station.
L/I Indicates a local station or an intelligent device station.


7 - 12

## 7.7 Switch Settings

This section explains how to set the module switches.

### 7.7.1 Station number setting

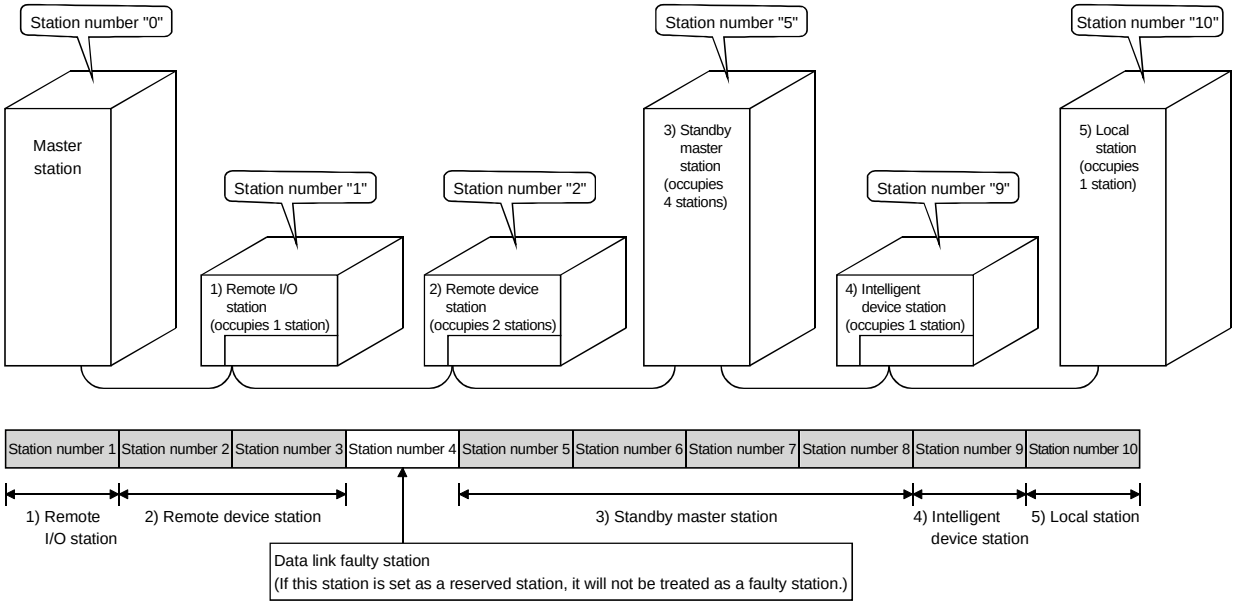
The following explains how to set the station numbers for the master station, local station, standby master station, remote station and intelligent device station.
For details on the station number setting switches, see Section 7.3.

Specify the station numbers according to the following conditions.

(1) Specify sequential station numbers
Station numbers can be specified regardless of the order in which the stations are connected.
For a module occupying two or more stations, specify the first station number.

(2) Specify unique station numbers
If duplicate station numbers are specified, an installation error occurs. (Error codes are stored in SW0069)

[Setting example] When station numbers are specified by skipping one station number


Station number "0"
Master station
Station number "1"
1) Remote I/O station (occupies 1 station)
Station number "2"
2) Remote device station (occupies 2 stations)
Station number "5"
3) Standby master station (occupies 4 stations)
Station number "9"
4) Intelligent device station (occupies 1 station)
Station number "10"
5) Local station (occupies 1 station)
Station number 1
Station number 2
Station number 3
Station number 4
Station number 5
Station number 6
Station number 7
Station number 8
Station number 9
Station number 10
1) Remote I/O station
2) Remote device station
3) Standby master station
4) Intelligent device station
5) Local station
Data link faulty station
(If this station is set as a reserved station, it will not be treated as a faulty station.)

**POINT**

Specify unoccupied station numbers as reserved stations. An unoccupied station number will be treated as a "data link faulty station" (can be verified with link special registers SW0080 to SW0083).

## 7.7.2 Transmission rate and mode settings

Transmission rate and mode settings are specified with the "transmission rate/mode setting switch".
For details on the transmission rate/mode setting switch, see Section 7.3.

The transmission rate that can be set varies depending on the total distance.
For more details, see Sections 3.1.1 and 3.1.2.

| POINT |
| --- |
| Use the same transmission rate for the master station, remote stations, local stations, intelligent device stations and the standby master station.<br>If the setting for even one of the stations is different, data link cannot be established properly. |

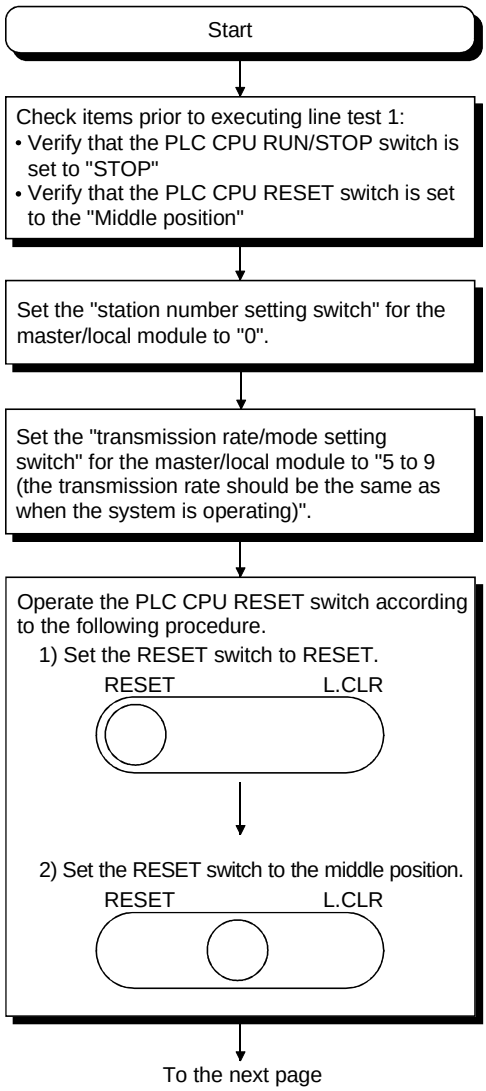
## 7.8 Checking the Connection Status (Line Test)

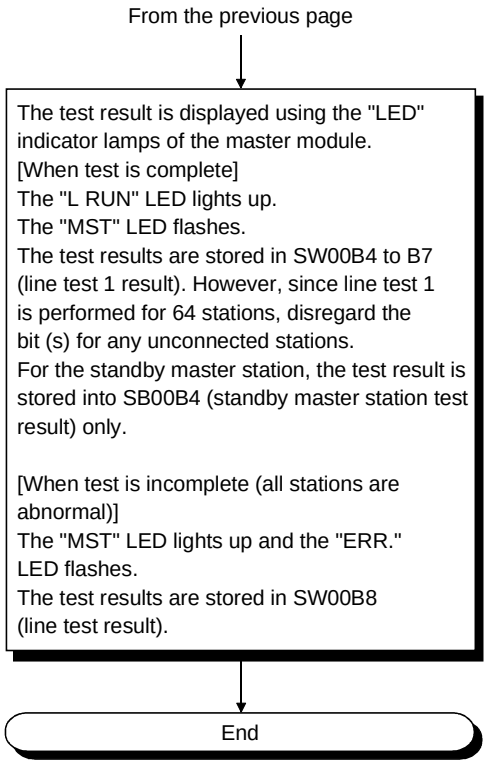
After connecting all of the modules with CC-Link dedicated cables, verify that they are correctly connected and that data linking can be performed with remote stations, local stations, intelligent device stations and the standby master station.
Line test 1 checks the status of communication with all modules that have been connected.
Line test 2 checks the status of communication with specific modules.
Neither line test 1 nor line test 2 requires parameter settings.

**POINT**

(1) Line test 2 is performed when an error is generated by line test 1.
Thus, if the result of line test 1 is normal, there is no need to conduct line test 2.
(2) Network parameter setting is required to execute Line test 2 for the standby master station.

(1) Checking the connection status and the status of communication with remote stations/local stations/intelligent device stations/standby master station (line test 1)
Perform the line test according to the following procedure.


Start
Check items prior to executing line test 1:
• Verify that the PLC CPU RUN/STOP switch is set to "STOP"
• Verify that the PLC CPU RESET switch is set to the "Middle position"
Set the "station number setting switch" for the master/local module to "0".
Set the "transmission rate/mode setting switch" for the master/local module to "5 to 9 (the transmission rate should be the same as when the system is operating)".
Operate the PLC CPU RESET switch according to the following procedure.
1) Set the RESET switch to RESET.
RESET
L.CLR
2) Set the RESET switch to the middle position.
RESET
L.CLR
To the next page

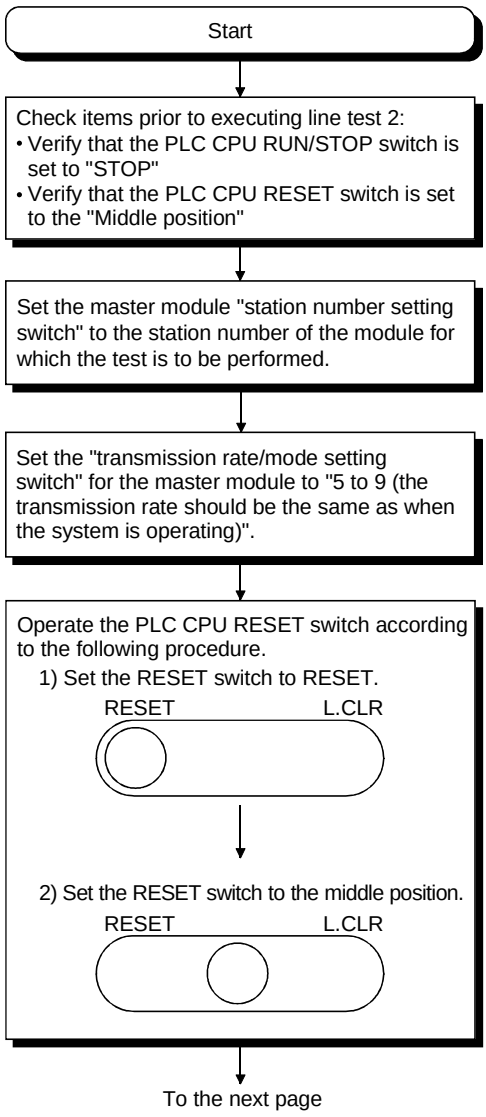

From the previous page
The test result is displayed using the "LED" indicator lamps of the master module.
[When test is complete]
The "L RUN" LED lights up.
The "MST" LED flashes.
The test results are stored in SW00B4 to B7 (line test 1 result). However, since line test 1 is performed for 64 stations, disregard the bit (s) for any unconnected stations.
For the standby master station, the test result is stored into SB00B4 (standby master station test result) only.
[When test is incomplete (all stations are abnormal)]
The "MST" LED lights up and the "ERR." LED flashes.
The test results are stored in SW00B8 (line test result).
End


7 - 16

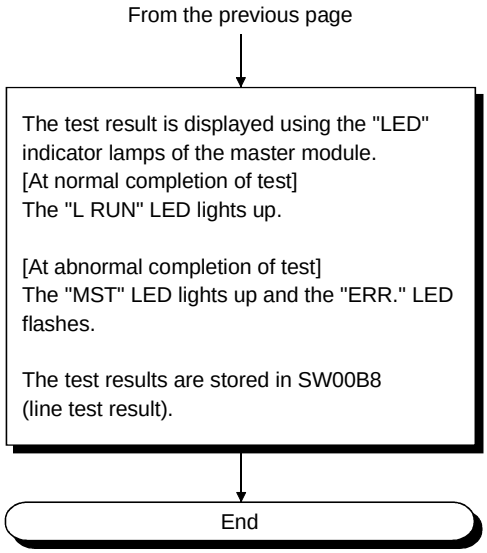
(2) Checking the status of communication with a specific remote station/local station/intelligent device station/standby master station (line test 2)

Line test 2 checks whether data linking can be performed normally with a specific remote station, local station, intelligent device station or standby master station.

Execute line test 2 according to the following procedure.


Start
Check items prior to executing line test 2:
• Verify that the PLC CPU RUN/STOP switch is set to "STOP"
• Verify that the PLC CPU RESET switch is set to the "Middle position"
Set the master module "station number setting switch" to the station number of the module for which the test is to be performed.
Set the "transmission rate/mode setting switch" for the master module to "5 to 9 (the transmission rate should be the same as when the system is operating)".
Operate the PLC CPU RESET switch according to the following procedure.
1) Set the RESET switch to RESET.
RESET
L.CLR
2) Set the RESET switch to the middle position.
RESET
L.CLR
To the next page


7 - 17


From the previous page
The test result is displayed using the "LED" indicator lamps of the master module.
[At normal completion of test]
The "L RUN" LED lights up.
[At abnormal completion of test]
The "MST" LED lights up and the "ERR." LED flashes.
The test results are stored in SW00B8 (line test result).
End


7 - 18

# 8 PROGRAMMING

This chapter explains common items relating to programming.

## 8.1 Precautions on Programming

The following explains precautions on the creation of a program:

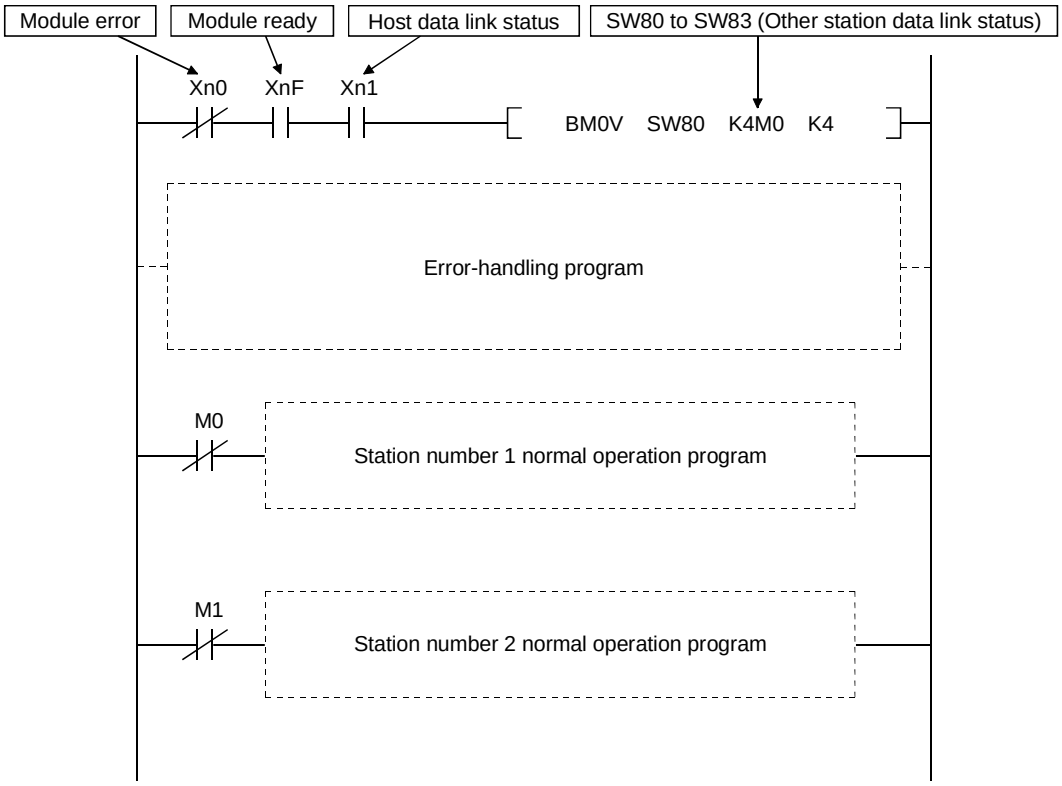
Create a program that allows the detection of data-link status and interlocking with the remote I/O stations, remote device stations, local stations, intelligent device stations, and standby master station.
In addition, create an error-handling program.

### [Program example]

Set the "Special Relay (SB) Refresh Device" to "SB0" and the "Special Register (SW) Refresh Device" to "SW0" of the master station with GX Developer.

**POINT**

When setting the refresh devices of the special relay (SB) and the special register (SW) to SB and SW, respectively, make sure that they do not duplicate with device numbers on the MELSECNET/H network.




8

## 8.2 I/O Signals for the PLC CPU

This section explains the input/output signals for the PLC CPU of the master/local module.

### 8.2.1 I/O signal list

Table 8.1 shows a list of the I/O signals.
The "n" in the table indicates the master/local module's first I/O number, which is determined by both the installation position and the module installed before the master/local module.
<Example> When the master/local module's first I/O number is "X/Y30"
Xn0 to X (n + 1) F → X30 to X4F
Yn0 to Y (n + 1) F → Y30 to Y4F

Table 8.1 I/O signal list

| Signal direction: PLC CPU ← Master/local module | | | | Signal direction: PLC CPU → Master/local module | | | |
|---|---|---|---|---|---|---|---|
| Input number | Signal name | Availability | | Output number | Signal name | Availability | |
| | | Master station | Local station | | | Master station | Local station |
| Xn0 | Module error | ○ | ○ | Yn0 | Use prohibited | — | — |
| Xn1 | Host data link status | ○ | ○ | Yn1 | | | |
| Xn2 | Use prohibited | — | — | Yn2 | | | |
| Xn3 | Other station data link status | ○ | ○ | Yn3 | | | |
| Xn4 | Use prohibited | — | — | Yn4 | | | |
| Xn5 | | | | Yn5 | | | |
| Xn6 | | | | Yn6 | | | |
| Xn7 | | | | Yn7 | | | |
| Xn8 | | | | Yn8 | | | |
| Xn9 | | | | Yn9 | | | |
| XnA | | | | YnA | | | |
| XnB | | | | YnB | | | |
| XnC | | | | YnC | | | |
| XnD | | | | YnD | | | |
| XnE | | | | YnE | | | |
| XnF | Module ready | ○ | ○ | YnF | | | |
| X (n+1) 0 | Use prohibited | — | — | Y (n+1) 0 | | | |
| X (n+1) 1 | | | | Y (n+1) 1 | | | |
| X (n+1) 2 | | | | Y (n+1) 2 | | | |
| X (n+1) 3 | | | | Y (n+1) 3 | | | |
| X (n+1) 4 | | | | Y (n+1) 4 | | | |
| X (n+1) 5 | | | | Y (n+1) 5 | | | |
| X (n+1) 6 | | | | Y (n+1) 6 | | | |
| X (n+1) 7 | | | | Y (n+1) 7 | | | |
| X (n+1) 8 | | | | Y (n+1) 8 | | | |
| X (n+1) 9 | | | | Y (n+1) 9 | | | |
| X (n+1) A | | | | Y (n+1) A | | | |
| X (n+1) B | | | | Y (n+1) B | | | |
| X (n+1) C | | | | Y (n+1) C | | | |
| X (n+1) D | | | | Y (n+1) D | | | |
| X (n+1) E | | | | Y (n+1) E | | | |
| X (n+1) F | | | | Y (n+1) F | | | |

**IMPORTANT**

The use-prohibited output signals shown in Table 8.1 are accessed by the system and cannot be accessed by the user.
In the event these signals are used (turned on/off) by the user, normal operations cannot be guaranteed.

**POINT**

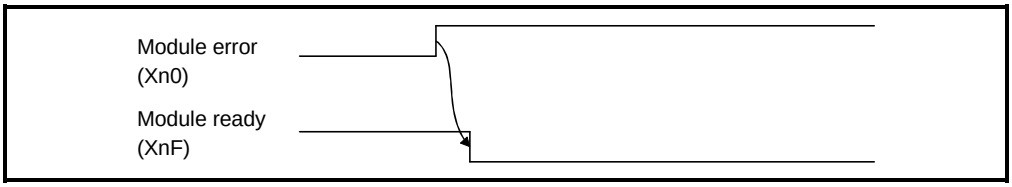
In the A/QnA series, data link startup was performed by setting the "Yn6 (Data Link Startup Request initiated by a buffer memory parameter)" and "Yn8 (Data link Startup Request initiated by an $E^2$PROM parameter)".
Do not use "Yn6" and "Yn8" for the Q series because the data link startup is automatically performed.

## 8.2.2 Details of the I/O signals

The following explains the on/off timings and conditions of the I/O signals shown in Table 8.1:

### (1) Module error: Xn0

This signal indicates whether the module is normal or faulty.
OFF: Module normal
ON : Module error




### (2) Host data link status: Xn1

This signal indicates the data link status of the host station.
OFF: Data link is stopped
ON : Data linking in progress

### (3) Other station data link status: Xn3

This signal indicates the data link status of other stations (remote, local, intelligent device and standby master stations).
The SB0080 signal has the same contents.
OFF: All stations normal
ON : There is a faulty station (the faulty station status is stored in SW0080 to SW0083)

**POINT**

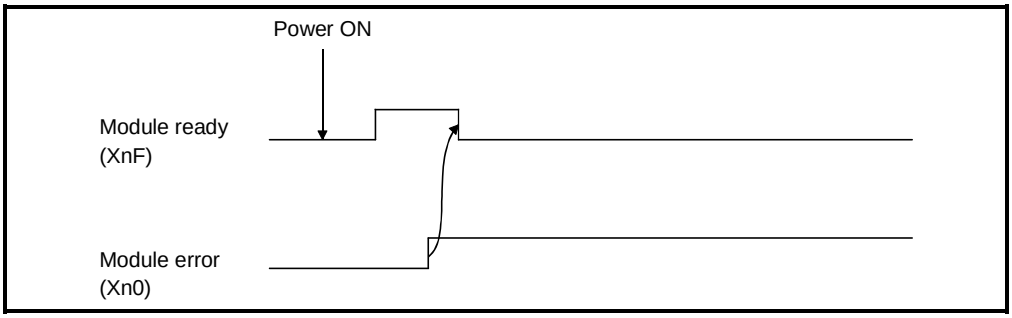
The other station data link status (Xn3) takes up to 6 seconds to turn on after a slave station connected to the master/local station becomes faulty.
The time to turn ON differs according to the system configuration, faulty status or other conditions.

### (4) Module ready: XnF

This signal indicates whether the module is ready to operate.

(a) When the module reaches ready-to-operate status, this signal turns ON automatically.

(b) This signal turns OFF when either of the following conditions occurs:
1) When an error is detected in the switch setting status for the module
2) When the module error signal (Xn0) turns ON



## 8.3 Buffer Memory

The buffer memory transfers data between the master/local module and the PLC CPU. The reading and writing of data are performed by parameter settings or with dedicated instructions using the GX Developer.
The contents of the buffer memory return to the default when the power is turned OFF or the PLC CPU is reset.

### 8.3.1 Buffer memory list

The buffer memory list is shown in Table 8.2.

Table 8.2 Buffer memory list (1/3)

| Address | | Item | Description | Read/write possibility | Availability | | Reference section |
|---|---|---|---|---|---|---|---|
| Hexadecimal | Decimal | | | | Master station | Local station | |
| $0_H$ to $DF_H$ | 0 to 223 | Parameter information area | Stores the parameter settings. | Read only | ○ | — | Section 8.3.2 (1) |
| $E0_H$ to $15F_H$ | 224 to 351 | Remote input (RX) *2 | For the master station: Stores the input status from the remote/local /intelligent device/standby master stations. | Read only | ○ | — | Section 8.3.2 (2) |
| | | | For the local station : Stores the input status from the master station. | | — | ○ | |
| $160_H$ to $1DF_H$ | 352 to 479 | Remote output (RY) *2 | For the master station: Stores the output status to the remote/local /intelligent device/standby master stations. | Write only | ○ | — | |
| | | | For the local station : Stores the output status to the master station. Also, stores the receive data from the remote/other local/intelligent device/standby master stations. | Read/write enabled | — | ○ | |
| $1E0_H$ to $2DF_H$ | 480 to 735 | Remote register (RWw) *2 Master station: For sending Local station: For sending/receiving | For the master station: Stores the send data to the remote device/all local /intelligent device/standby master stations. | Write only | ○ | — | Section 8.3.2 (3) |
| | | | For the local station : Stores the send data to the master/other local/intelligent device/standby master stations. Also, stores the receive data from the remote device/other local/intelligent device/standby master stations. | Read/write enabled | — | ○ | |

○: Available, — : Not available

Table 8.2 Buffer memory list (2/3)

| Address | | Item | Description | Read/write possibility | Availability | | Reference section |
|---|---|---|---|---|---|---|---|
| Hexadecimal | Decimal | | | | Master station | Local station | |
| $2E0_H$ to $3DF_H$ | 736 to 991 | Remote register (RWr) *2<br>Master station: For receiving<br>Local station: For receiving | For the master station: Stores the receive data from the remote device/local/intelligent device/standby master stations. | Read only | ○ | — | Section 8.3.2 (3) |
| | | | For the local station : Stores the receive data from the master station. | | — | ○ | |
| $3E0_H$ to $5DF_H$ | 992 to 1503 | Slave station offset, size information | Stores the offset and size of RX/RY/RWw/RWr per remote station/local station/intelligent device station/standby master station. | Read only | ○ | ○ | Section 8.3.2 (4) |
| $5E0_H$ to $5FF_H$ | 1504 to 1535 | Link special relay (SB) | Stores the data link status. | Read/write enabled (write may be disabled depending on the device) | ○ | ○ | Section 8.3.2 (5) |
| $600_H$ to $7FF_H$ | 1536 to 2047 | Link special register (SW) | Stores the data link status. | | | | Section 8.3.2 (6) |
| $800_H$ to $9FF_H$ | 2048 to 2559 | Use prohibited *1 | — | — | — | — | — |
| $A00_H$ to $FFF_H$ | 2560 to 4095 | Random access buffer | The specified data is stored and used by transient transmission. | Read/write enabled | ○ | ○ | Section 8.3.2 (7) |
| $1000_H$ to $1FFF_H$ | 4096 to 8191 | Communication buffers | Stores the send and receive data and control data when performing transient transmission (communication using the communication buffers) with the local station, standby master station, and intelligent device station. | Read/write enabled | ○ | ○ | Section 8.3.2 (8) |
| $2000_H$ to $2FFF_H$ | 8192 to 12287 | Automatic update buffer | Stores the automatic update data when performing transient transmission with the AJ65BT-R2 (communication using the automatic update buffer). | Read/write enabled | ○ | — | Section 8.3.2 (9) |
| $3000_H$ to $3FFF_H$ | 12288 to 16383 | Use prohibited *1 | — | — | — | — | — |

○: Available, — : Not available


8 - 6

Table 8.2 Buffer memory list (3/3)

| Address | | Item | Description | Read/write possibility | Availability | | Reference section |
|---|---|---|---|---|---|---|---|
| Hexadecimal | Decimal | | | | Master station | Local station | |
| 4000H to 41FFH | 16384 to 16895 | Ver. 2 compatible remote input (RX) *3 | For the master station: Stores the input status from the remote/local /intelligent device/standby master stations. | Read only | ○ | — | Section 8.3.2 (10) |
| | | | For the local station : Stores the input status from the master station. | | — | ○ | |
| 4200H to 43FFH | 16896 to 17407 | Ver. 2 compatible remote output (RY) *3 | For the master station: Stores the output status to the remote/local /intelligent device/standby master stations. | Write only | ○ | — | |
| | | | For the local station : Stores the output status to the master station. Also, stores the receive data from the remote/other local/intelligent device/standby master stations. | Read/write enabled | — | ○ | |
| 4400H to 4BFFH | 17408 to 19455 | Ver. 2 compatible remote register (RWw) *3 Master station: For sending Local station: For sending/receiving | For the master station: Stores the send data to the remote device/all local /intelligent device/standby master stations. | Write only | ○ | — | Section 8.3.2 (11) |
| | | | For the local station : Stores the send data to the master/other local/intelligent device/standby master stations. Also, stores the receive data from the remote device/other local/intelligent device/standby master stations. | Read/write enabled | — | ○ | |
| 4C00H to 53FFH | 19456 to 21503 | Ver. 2 compatible remote register (RWr) *3 Master station: For receiving Local station: For receiving | For the master station: Stores the receive data from the remote device/local/intelligent device/standby master stations. | Read only | ○ | — | |
| | | | For the local station : Stores the receive data from the master station. | | — | ○ | |
| 5400H to 7FFFH | 21504 to 32767 | Use prohibited *1 | — | — | — | — | — |

○: Available, — : Not available

*1 Do not write to any area where use is prohibited. This may cause errors.
*2 Used when the remote net ver. 1 mode or remote net additional mode is selected.
*3 Used when the remote net ver. 2 mode or remote net additional mode is selected.

## 8.3.2 Buffer memory details

The following explains the details of items shown in Table 8.2, "Buffer Memory List" in Section 8.3.1.

### (1) Parameter information area

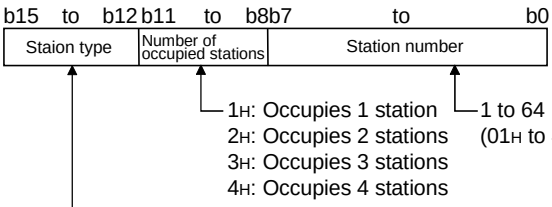
Stores the parameter settings.

Do not perform write to the parameter information area. Doing so may cause an error.

Table 8.3 Parameter Information Area List (1/3)

| Addres | | Item | Description |
|---|---|---|---|
| Hex. | Dec. | | |
| 0H | 0 | (Use prohibited) | — |
| 1H | 1 | Number of connected modules | Stores the total number of remote stations, local stations, intelligent device stations and standby master station that are connected to the master station (including reserved stations).<br>Default value: 64 (modules)<br>Storage area: 1 to 64 (modules) |
| 2H | 2 | Number of retries | Stores the number of retries when a communication error occurs.<br>Default value: 3 (times)<br>Storage area: 1 to 7 (times) |
| 3H | 3 | Number of automatic return modules | Stores the total number of remote stations, local stations, intelligent device stations and standby master station that can be returned to system operation by a single link scan.<br>Default value: 1 (module)<br>Storage area: 1 to 10 (modules) |
| 4H | 4 | Standby master station specification | Stores the station number of the standby master station.<br>Default value: 0 (no standby master station specified)<br>Storage area: 0 to 64 (0: No standby master station specified) |
| 5H | 5 | (Use prohibited) | — |
| 6H | 6 | Operation specification when CPU is down | Stores the data link status when a master station PLC CPU error occurs.<br>Default value: 0 (Stop)<br>Storage area: 0 (Stop)<br>: 1 (Continue) |
| 7H | 7 | Scan mode specification | Stores either the synchronous or asynchronous mode for sequence scan.<br>Default value: 0 (Asynchronous)<br>Storage area: 0 (Asynchronous)<br>: 1 (Synchronous) |
| 8H | 8 | Delay time setting | Stores the link scan interval. (Unit: 50 μs)<br>Default value: 0 (0: Not specified)<br>Storage area: 0 to 100 (0: Not specified) |
| 10H to 13H | 16 to 19 | Reserved station specification | Stores the reserved station.<br>Default value: 0 (Not specified)<br>Storage area: Bit corresponding to the station number turns on. |
| 14H to 17H | 20 to 23 | Error invalid station specification | Stores the error invalid station.<br>Default value: 0 (Not specified)<br>Storage area: Bit corresponding to the station number turns on. |

Table 8.3 Parameter Information Area List (2/3)

| Addres Hex. | Addres Dec. | Item | Description |
|---|---|---|---|
| 18H to 1FH | 24 to 31 | (Use prohibited) | — |
| 20H (first module) to 5FH (64th module) | 32 (first module) to 95 (64th module) | Station information | Stores the setting status of the types of the connected remote, local, intelligent device and standby master stations.<br>Default value: 0101H (Ver.1compatible remote I/O station, Occupies 1 station, Station number 1) to 0140H (Ver.1compatible remote I/O station, Occupies 1 station, Station number 64)<br>Storage area: See below<br>  |
| 60H to 7FH | 96 to 127 | (Use prohibited) | — |
| 80H(Send buffer)<br>81H(Receive buffer)<br>82H(Automatic update buffer)<br>The first intelligent device<br>to<br>CBH(Send buffer)<br>CCH(Receive buffer)<br>CDH(Automatic update buffer)<br>The 26th intelligent device | 128(Send buffer)<br>129(Receive buffer)<br>130(Automatic update buffer)<br>The first intelligent device<br>to<br>203(Send buffer)<br>204(Receive buffer)<br>205(Automatic update buffer)<br>The 26th intelligent device | Allocation of communication buffer and automatic update buffer | Stores the buffer memory assignment status at transient transmission to the local, intelligent device and standby master stations.<br>Default value<br>Send buffer size: 40H (64) (word)<br>Receive buffer size: 40H (64) (word)<br>Automatic update buffer size: 80H (128) (word)<br>Storage area<br>・Communication buffer : 0H (0) (word) (no setting) or 40H (64) (word) to 1000H (4096) (word)<br>Note that the total size of the communication buffer is within 1000H (4096) (word).<br>・Automatic update buffer: 0H (0) (word) (no setting) or 80H (128) (word) to 1000H (4096) (word)<br>Note that the total size of the automatic update buffers is within 1000H (4096) (word). |
| CEH, CFH | 206, 207 | (Use prohibited) | — |
| D0H to D3H | 208 to 211 | 8-point remote I/O station setting | Stores the station numbers of the remote I/O stations set as 8 points in the remote I/O station points setting. ＊1, ＊2<br>Default value: 0 (no setting)<br>Storage area: Bit corresponding to the station number turns on. |

＊1 Used in the remote net ver. 2 mode or remote net additional mode.

＊2 When the setting is "8 points + 8 points (reserved)", the station numbers are stored into both the 8-point remote I/O station setting and 16-point remote I/O station setting.

Table 8.3 Parameter Information Area List (3/3)

| Addres | | Item | Description |
|---|---|---|---|
| Hex. | Dec. | | |
| $D4_H$ to $D7_H$ | 212 to 215 | 16-point remote I/O station setting | Stores the station numbers of the remote I/O stations set as 16 points in the remote I/O station points setting. ∗1, ∗2<br>Default value: 0 (no setting)<br>Storage area: Bit corresponding to the station number turns on. |
| $D8_H$ to $DB_H$ | 216 to 219 | 0 points reserve station setting | Stores the station numbers of the reserved stations set to 0 points. ∗1<br>Default value: 0 (no setting)<br>Storage area: Bit corresponding to the station number turns on. |
| $DC_H$ to $DF_H$ | 220 to 223 | (Use prohibited) | — |

∗1 Used in the remote net ver. 2 mode or remote net additional mode.
∗2 When the setting is "8 points + 8 points (reserved)", the station numbers are stored into both the 8-point remote I/O station setting and 16-point remote I/O station setting.

### (2) Remote input (RX) and remote output (RY)

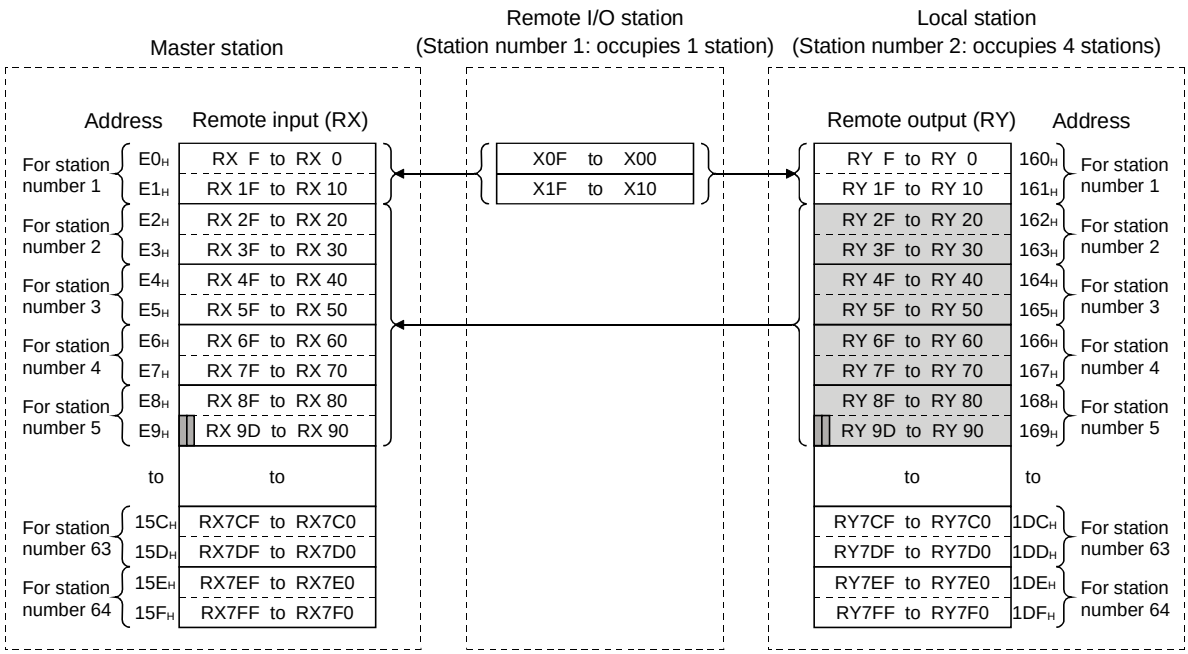
Used when the remote net ver. 1 mode or remote net additional mode is selected.

(a) Master station ← remote I/O station/remote device station/local station

1) Master station
- The input status from the remote I/O station, remote device station (RX) and local station (RY) is stored.
- Two words are used per station.

2) Local station
- Data to be sent to the master station is stored in the remote output (RY) of the address corresponding to the host station number.
- The input status from the remote I/O station, remote device station (RX) and other local station is stored.
- Two words are used per station.

▯ ... The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RY9E and RY9F cannot be used.)



The following tables show the station numbers and corresponding buffer-memory addresses.

## [Master station]

Table of station numbers and corresponding buffer memory addresses

| Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E0H to E1H | 14 | FAH to FBH | 27 | 114H to 115H | 40 | 12EH to 12FH | 53 | 148H to 149H |
| 2 | E2H to E3H | 15 | FCH to FDH | 28 | 116H to 117H | 41 | 130H to 131H | 54 | 14AH to 14BH |
| 3 | E4H to E5H | 16 | FEH to FFH | 29 | 118H to 119H | 42 | 132H to 133H | 55 | 14CH to 14DH |
| 4 | E6H to E7H | 17 | 100H to 101H | 30 | 11AH to 11BH | 43 | 134H to 135H | 56 | 14EH to 14FH |
| 5 | E8H to E9H | 18 | 102H to 103H | 31 | 11CH to 11DH | 44 | 136H to 137H | 57 | 150H to 151H |
| 6 | EAH to EBH | 19 | 104H to 105H | 32 | 11EH to 11FH | 45 | 138H to 139H | 58 | 152H to 153H |
| 7 | ECH to EDH | 20 | 106H to 107H | 33 | 120H to 121H | 46 | 13AH to 13BH | 59 | 154H to 155H |
| 8 | EEH to EFH | 21 | 108H to 109H | 34 | 122H to 123H | 47 | 13CH to 13DH | 60 | 156H to 157H |
| 9 | F0H to F1H | 22 | 10AH to 10BH | 35 | 124H to 125H | 48 | 13EH to 13FH | 61 | 158H to 159H |
| 10 | F2H to F3H | 23 | 10CH to 10DH | 36 | 126H to 127H | 49 | 140H to 141H | 62 | 15AH to 15BH |
| 11 | F4H to F5H | 24 | 10EH to10FH | 37 | 128H to 129H | 50 | 142H to 143H | 63 | 15CH to 15DH |
| 12 | F6H to F7H | 25 | 110H to 111H | 38 | 12AH to 12BH | 51 | 144H to 145H | 64 | 15EH to 15FH |
| 13 | F8H to F9H | 26 | 112H to 113H | 39 | 12CH to 12DH | 52 | 146H to 147H | — | — |

## [Local station]

Table of station numbers and corresponding buffer memory addresses

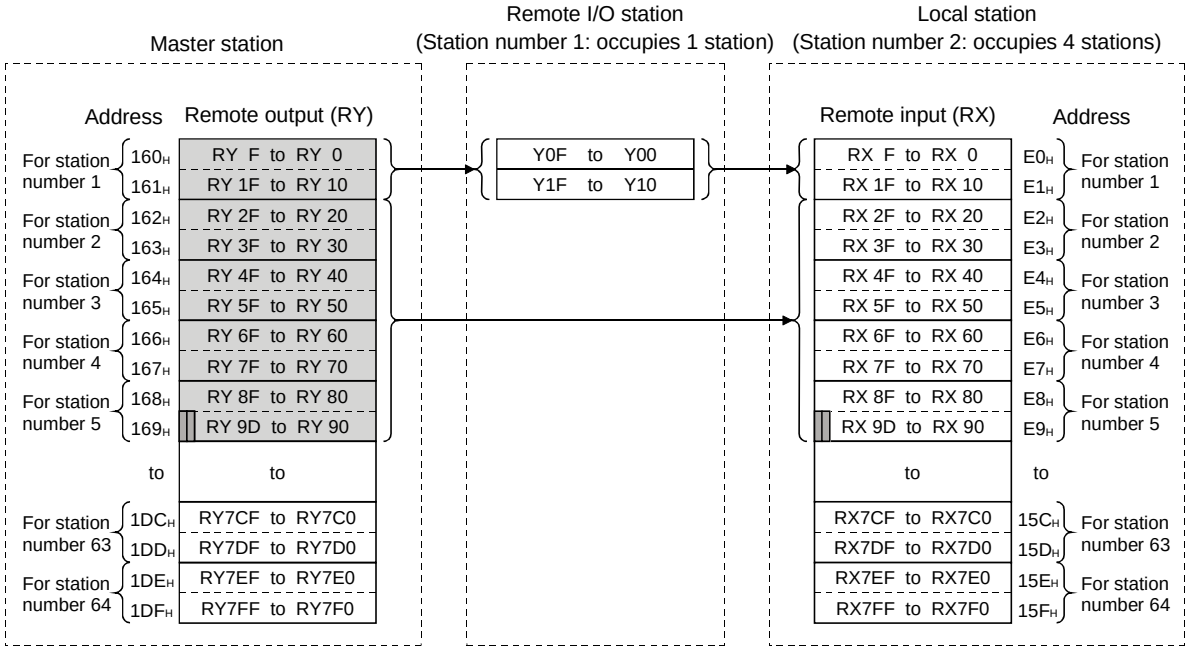
| Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 160H to 161H | 14 | 17AH to 17BH | 27 | 194H to 195H | 40 | 1AEH to 1AFH | 53 | 1C8H to 1C9H |
| 2 | 162H to 163H | 15 | 17CH to 17DH | 28 | 196H to 197H | 41 | 1B0H to 1B1H | 54 | 1CAH to 1CBH |
| 3 | 164H to 165H | 16 | 17EH to 17FH | 29 | 198H to 199H | 42 | 1B2H to 1B3H | 55 | 1CCH to 1CDH |
| 4 | 166H to 167H | 17 | 180H to 181H | 30 | 19AH to 19BH | 43 | 1B4H to 1B5H | 56 | 1CEH to 1CFH |
| 5 | 168H to 169H | 18 | 182H to 183H | 31 | 19CH to 19DH | 44 | 1B6H to 1B7H | 57 | 1D0H to 1D1H |
| 6 | 16AH to 16BH | 19 | 184H to 185H | 32 | 19EH to 19FH | 45 | 1B8H to 1B9H | 58 | 1D2H to 1D3H |
| 7 | 16CH to 16DH | 20 | 186H to 187H | 33 | 1A0H to 1A1H | 46 | 1BAH to 1BBH | 59 | 1D4H to 1D5H |
| 8 | 16EH to 16FH | 21 | 188H to 189H | 34 | 1A2H to 1A3H | 47 | 1BCH to 1BDH | 60 | 1D6H to 1D7H |
| 9 | 170H to 171H | 22 | 18AH to 18BH | 35 | 1A4H to 1A5H | 48 | 1BEH to 1BFH | 61 | 1D8H to 1D9H |
| 10 | 172H to 173H | 23 | 18CH to 18DH | 36 | 1A6H to 1A7H | 49 | 1C0H to 1C1H | 62 | 1DAH to 1DBH |
| 11 | 174H to 175H | 24 | 18EH to 18FH | 37 | 1A8H to 1A9H | 50 | 1C2H to 1C3H | 63 | 1DCH to 1DDH |
| 12 | 176H to 177H | 25 | 190H to 191H | 38 | 1AAH to 1ABH | 51 | 1C4H to 1C5H | 64 | 1DEH to 1DFH |
| 13 | 178H to 179H | 26 | 192H to 193H | 39 | 1ACH to 1ADH | 52 | 1C6H to 1C7H | — | — |

(b) Master station → remote I/O station/remote device station/local station

1) Master station
   - The output status to the remote I/O station, remote device station (RY) and all local stations (RX) is stored.
   - Two words are used per station.

2) Local station
   - The data received from the remote I/O station, remote device station (RY) and master station (RY) is stored.
   - Two words are used per station.

▥ ... The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RY9E and RY9F cannot be used.)



The following tables show the station numbers and corresponding buffer memory addresses.

## [Master station]

Table of station numbers and corresponding buffer memory addresses

| Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 160H to 161H | 14 | 17AH to 17BH | 27 | 194H to 195H | 40 | 1AEH to 1AFH | 53 | 1C8H to 1C9H |
| 2 | 162H to 163H | 15 | 17CH to 17DH | 28 | 196H to 197H | 41 | 1B0H to 1B1H | 54 | 1CAH to 1CBH |
| 3 | 164H to 165H | 16 | 17EH to 17FH | 29 | 198H to 199H | 42 | 1B2H to 1B3H | 55 | 1CCH to 1CDH |
| 4 | 166H to 167H | 17 | 180H to 181H | 30 | 19AH to 19BH | 43 | 1B4H to 1B5H | 56 | 1CEH to 1CFH |
| 5 | 168H to 169H | 18 | 182H to 183H | 31 | 19CH to 19DH | 44 | 1B6H to 1B7H | 57 | 1D0H to 1D1H |
| 6 | 16AH to 16BH | 19 | 184H to 185H | 32 | 19EH to 19FH | 45 | 1B8H to 1B9H | 58 | 1D2H to 1D3H |
| 7 | 16CH to 16DH | 20 | 186H to 187H | 33 | 1A0H to 1A1H | 46 | 1BAH to 1BBH | 59 | 1D4H to 1D5H |
| 8 | 16EH to 16FH | 21 | 188H to 189H | 34 | 1A2H to 1A3H | 47 | 1BCH to 1BDH | 60 | 1D6H to 1D7H |
| 9 | 170H to 171H | 22 | 18AH to 18BH | 35 | 1A4H to 1A5H | 48 | 1BEH to 1BFH | 61 | 1D8H to 1D9H |
| 10 | 172H to 173H | 23 | 18CH to 18DH | 36 | 1A6H to 1A7H | 49 | 1C0H to 1C1H | 62 | 1DAH to 1DBH |
| 11 | 174H to 175H | 24 | 18EH to 18FH | 37 | 1A8H to 1A9H | 50 | 1C2H to 1C3H | 63 | 1DCH to 1DDH |
| 12 | 176H to 177H | 25 | 190H to 191H | 38 | 1AAH to 1ABH | 51 | 1C4H to 1C5H | 64 | 1DEH to 1DFH |
| 13 | 178H to 179H | 26 | 192H to 193H | 39 | 1ACH to 1ADH | 52 | 1C6H to 1C7H | — | — |

## [Local station]

Table of station numbers and corresponding buffer memory addresses

| Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E0H to E1H | 14 | FAH to FBH | 27 | 114H to 115H | 40 | 12EH to 12FH | 53 | 148H to 149H |
| 2 | E2H to E3H | 15 | FCH to FDH | 28 | 116H to 117H | 41 | 130H to 131H | 54 | 14AH to 14BH |
| 3 | E4H to E5H | 16 | FEH to FFH | 29 | 118H to 119H | 42 | 132H to 133H | 55 | 14CH to 14DH |
| 4 | E6H to E7H | 17 | 100H to 101H | 30 | 11AH to 11BH | 43 | 134H to 135H | 56 | 14EH to 14FH |
| 5 | E8H to E9H | 18 | 102H to 103H | 31 | 11CH to 11DH | 44 | 136H to 137H | 57 | 150H to 151H |
| 6 | EAH to EBH | 19 | 104H to 105H | 32 | 11EH to 11FH | 45 | 138H to 139H | 58 | 152H to 153H |
| 7 | ECH to EDH | 20 | 106H to 107H | 33 | 120H to 121H | 46 | 13AH to 13BH | 59 | 154H to 155H |
| 8 | EEH to EFH | 21 | 108H to 109H | 34 | 122H to 123H | 47 | 13CH to 13DH | 60 | 156H to 157H |
| 9 | F0H to F1H | 22 | 10AH to 10BH | 35 | 124H to 125H | 48 | 13EH to 13FH | 61 | 158H to 159H |
| 10 | F2H to F3H | 23 | 10CH to 10DH | 36 | 126H to 127H | 49 | 140H to 141H | 62 | 15AH to 15BH |
| 11 | F4H to F5H | 24 | 10EH to10FH | 37 | 128H to 129H | 50 | 142H to 143H | 63 | 15CH to 15DH |
| 12 | F6H to F7H | 25 | 110H to 111H | 38 | 12AH to 12BH | 51 | 144H to 145H | 64 | 15EH to 15FH |
| 13 | F8H to F9H | 26 | 112H to 113H | 39 | 12CH to 12DH | 52 | 146H to 147H | — | — |

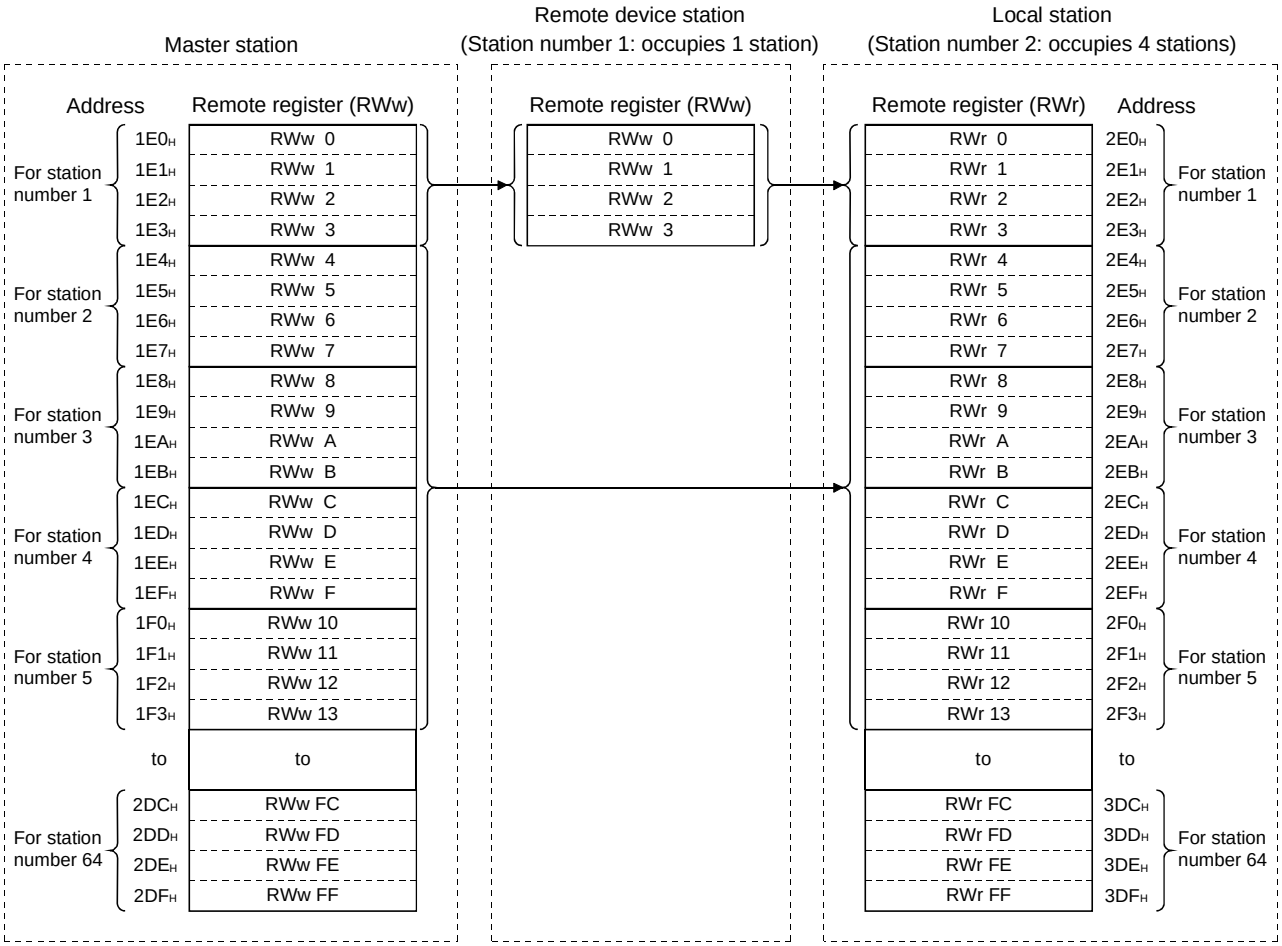
### (3) Remote registers (RWw) and (RWr)

Used when the remote net ver. 1 mode or remote net additional mode is selected.

(a) Master station (RWw) → remote device station (RWw)/local station (RWr)

1) Master station
- The data to be sent to the remote register (RWw) of the remote device station and the remote registers (RWr) of all local stations are stored.
- Four words are used per station.

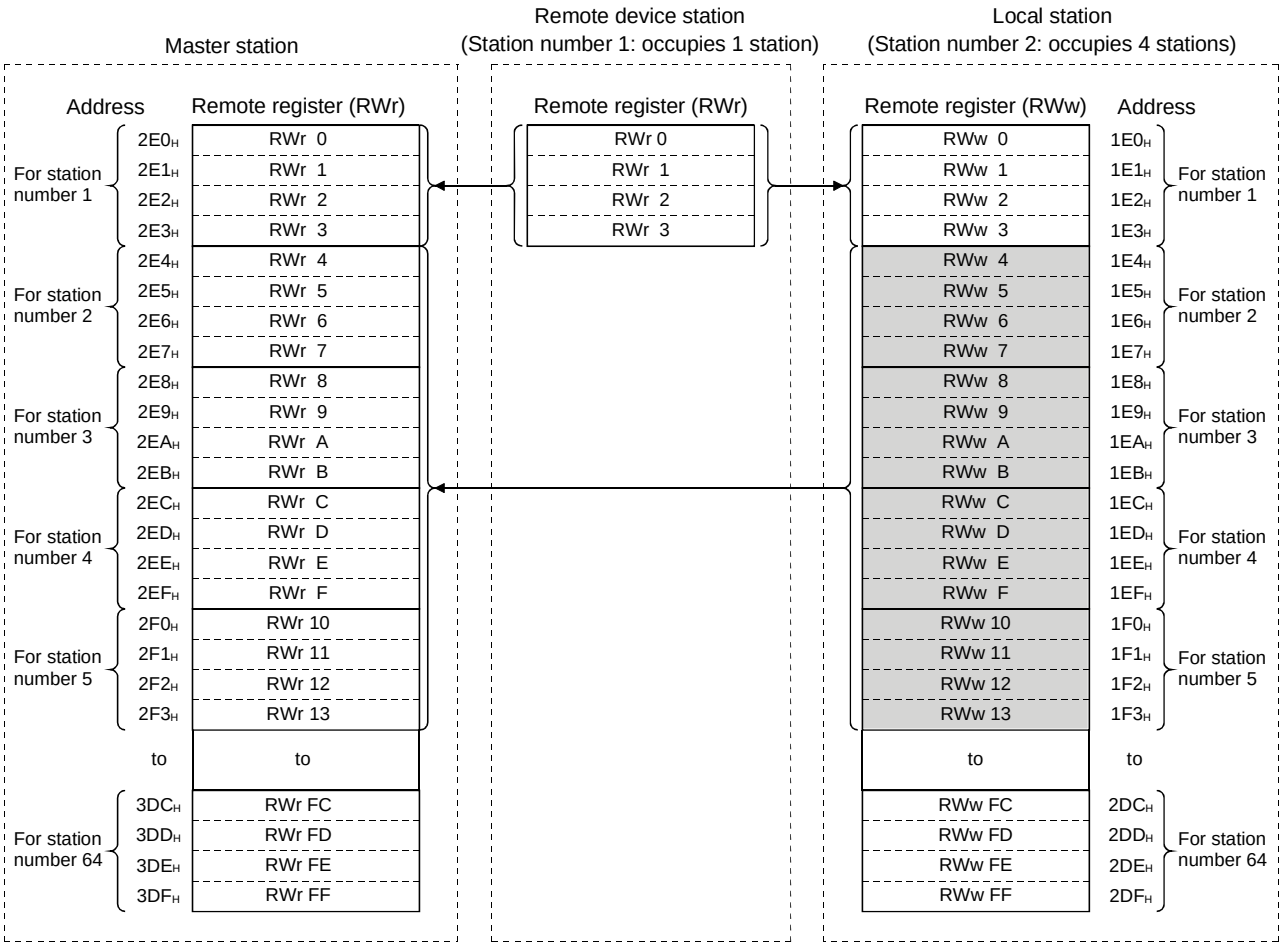
2) Local station
- The data sent to the remote register (RWw) of the remote device station can also be received.
- Four words are used per station.



(b) Master station (RWr) ← remote device station (RWr)/local station (RWw)

1) Master station
- The send data from the remote register (RWr) of the remote device station and the remote register (RWw) of the local station is stored.
- Four words are used per station.

2) Local station
- Data is sent to the master station and other local stations by storing it in the address corresponding to the host station number.
- Data in the remote register (RWr) of the remote device station can also be received.
- Four words are used per station.



The following tables show the station numbers and corresponding buffer memory addresses.

## [Master station]

Table of station numbers and corresponding buffer memory addresses

| Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2E0H to 2E3H | 14 | 314H to 317H | 27 | 348H to 34BH | 40 | 37CH to 37FH | 53 | 3B0H to 3B3H |
| 2 | 2E4H to 2E7H | 15 | 318H to 31BH | 28 | 34CH to 34FH | 41 | 380H to 383H | 54 | 3B4H to 3B7H |
| 3 | 2E8H to 2EBH | 16 | 31CH to 31FH | 29 | 350H to 353H | 42 | 384H to 387H | 55 | 3B8H to 3BBH |
| 4 | 2ECH to 2EFH | 17 | 320H to 323H | 30 | 354H to 357H | 43 | 388H to 38BH | 56 | 3BCH to 3BFH |
| 5 | 2F0H to 2F3H | 18 | 324H to 327H | 31 | 358H to 35BH | 44 | 38CH to 38FH | 57 | 3C0H to 3C3H |
| 6 | 2F4H to 2F7H | 19 | 328H to 32BH | 32 | 35CH to 35FH | 45 | 390H to 393H | 58 | 3C4H to 3C7H |
| 7 | 2F8H to 2FBH | 20 | 32CH to 32FH | 33 | 360H to 363H | 46 | 394H to 397H | 59 | 3C8H to 3CBH |
| 8 | 2FCH to 2FFH | 21 | 330H to 333H | 34 | 364H to 367H | 47 | 398H to 39BH | 60 | 3CCH to 3CFH |
| 9 | 300H to 303H | 22 | 334H to 337H | 35 | 368H to 36BH | 48 | 39CH to 39FH | 61 | 3D0H to 3D3H |
| 10 | 304H to 307H | 23 | 338H to 33BH | 36 | 36CH to 36FH | 49 | 3A0H to 3A3H | 62 | 3D4H to 3D7H |
| 11 | 308H to 30BH | 24 | 33CH to 33FH | 37 | 370H to 373H | 50 | 3A4H to 3A7H | 63 | 3D8H to 3DBH |
| 12 | 30CH to 30FH | 25 | 340H to 343H | 38 | 374H to 377H | 51 | 3A8H to 3ABH | 64 | 3DCH to 3DFH |
| 13 | 310H to 313H | 26 | 344H to 347H | 39 | 378H to 37BH | 52 | 3ACH to 3AFH | — | — |

## [Local station]

Table of station numbers and corresponding buffer memory addresses

| Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address | Station number | Buffer memory address |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1E0H to 1E3H | 14 | 214H to 217H | 27 | 248H to 24BH | 40 | 27CH to 27FH | 53 | 2B0H to 2B3H |
| 2 | 1E4H to 1E7H | 15 | 218H to 21BH | 28 | 24CH to 24FH | 41 | 280H to 283H | 54 | 2B4H to 2B7H |
| 3 | 1E8H to 1EBH | 16 | 21CH to 21FH | 29 | 250H to 253H | 42 | 284H to 287H | 55 | 2B8H to 2BBH |
| 4 | 1ECH to 1EFH | 17 | 220H to 223H | 30 | 254H to 257H | 43 | 288H to 28BH | 56 | 2BCH to 2BFH |
| 5 | 1F0H to 1F3H | 18 | 224H to 227H | 31 | 258H to 25BH | 44 | 28CH to 28FH | 57 | 2C0H to 2C3H |
| 6 | 1F4H to 1F7H | 19 | 228H to 22BH | 32 | 25CH to 25FH | 45 | 290H to 293H | 58 | 2C4H to 2C7H |
| 7 | 1F8H to 1FBH | 20 | 22CH to 22FH | 33 | 260H to 263H | 46 | 294H to 297H | 59 | 2C8H to 2CBH |
| 8 | 1FCH to 1FFH | 21 | 230H to 233H | 34 | 264H to 267H | 47 | 298H to 29BH | 60 | 2CCH to 2CFH |
| 9 | 200H to 203H | 22 | 234H to 237H | 35 | 268H to 26BH | 48 | 29CH to 29FH | 61 | 2D0H to 2D3H |
| 10 | 204H to 207H | 23 | 238H to 23BH | 36 | 26CH to 26FH | 49 | 2A0H to 2A3H | 62 | 2D4H to 2D7H |
| 11 | 208H to 20BH | 24 | 23CH to 23FH | 37 | 270H to 273H | 50 | 2A4H to 2A7H | 63 | 2D8H to 2DBH |
| 12 | 20CH to 20FH | 25 | 240H to 243H | 38 | 274H to 277H | 51 | 2A8H to 2ABH | 64 | 2DCH to 2DFH |
| 13 | 210H to 213H | 26 | 244H to 247H | 39 | 278H to 27BH | 52 | 2ACH to 2AFH | — | — |

### (4) Slave station offset, size information

In the remote net ver. 2 mode or remote net additional mode, the assignment of RX/RY/RWw/RWr for the station numbers varies according to the expanded cyclic setting and remote I/O station points setting.

(a) Offset

Stores the head buffer memory address of RX/RY/RWw/RWr assigned to each station.
When 2 or more stations are occupied, values are stored into only the head buffer memory address of the station number. (When station No. 1 occupies 2 stations, values are stored into the RX/RY/RWw/RWr offset and size of station No. 1, and the RX/RY/RWw/RWr offset and size of station No. 2 remains default.)

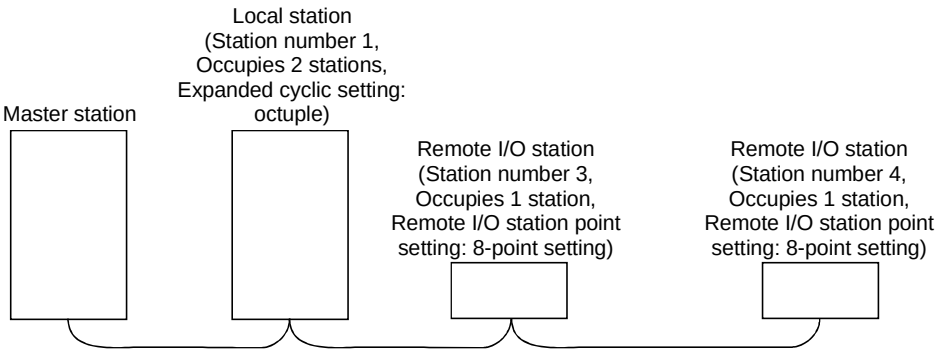
(b) Size

Stores the size of RX/RY/RWw/RWr assigned to each station in word unit.
When the size is less than 1 word, it is rounded up and 1 is stored. (When the remote I/O station points setting is 8 points, 1 is stored.)
Refer to Section 4.4.13 for the remote I/O station points setting method.
For the reserved station, $0000_H$ is stored.

Table 8.4 Correspondence between Station Numbers and RX/RY/RWw/RWr Offset, Size Buffer Memory Addresses

| Buffer memory address | | Item | Default (Hex.) |
|---|---|---|---|
| Hex. | Dec. | | |
| $3E0_H$ | 992 | Station No. 1 RX offset | $0000_H$ |
| $3E1_H$ | 993 | Station No. 1 RX size | $0000_H$ |
| to | to | to | — |
| $45E_H$ | 1118 | Station No. 64 RX offset | $0000_H$ |
| $45F_H$ | 1119 | Station No. 64 RX size | $0000_H$ |
| $460_H$ | 1120 | Station No. 1 RY offset | $0000_H$ |
| $461_H$ | 1121 | Station No. 1 RY size | $0000_H$ |
| to | to | to | — |
| $4DE_H$ | 1246 | Station No. 64 RY offset | $0000_H$ |
| $4DF_H$ | 1247 | Station No. 64 RY size | $0000_H$ |
| $4E0_H$ | 1248 | Station No. 1 RWw offset | $0000_H$ |
| $4E1_H$ | 1249 | Station No. 1 RWw size | $0000_H$ |
| to | to | to | — |
| $55E_H$ | 1374 | Station No. 64 RWw offset | $0000_H$ |
| $55F_H$ | 1375 | Station No. 64 RWw size | $0000_H$ |
| $560_H$ | 1376 | Station No. 1 RWr offset | $0000_H$ |
| $561_H$ | 1377 | Station No. 1 RWr size | $0000_H$ |
| to | to | to | — |
| $5DE_H$ | 1502 | Station No. 64 RWr offset | $0000_H$ |
| $5DF_H$ | 1503 | Station No. 64 RWr size | $0000_H$ |

Example) When the local station where expanded cyclic setting has been made and the remote I/O stations where remote I/O station points setting has been made are connected




| Buffer memory name | Value | Description |
|---|---|---|
| Station No. 1 RX offset | $4000_H$ | Head buffer memory address of RX of station No. 1 |
| Station No. 1 RX size | 24 ($18_H$) | 384 (number of RX points) / 16 = 24 words |
| Station No. 2 RX offset | $4000_H$ | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 2 RX size | 0 (default) | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 3 RX offset | $4018_H$ | Head buffer memory address of RX of station No. 3 |
| Station No. 3 RX size | 1 ($1_H$) | Though the lower 8 bits of the buffer memory address $4018_H$ are the corresponding size of RX of station No. 3, 1 is stored since less than 1 word is rounded up. |
| Station No. 4 RX offset | $4018_H$ | Head buffer memory address of RX of station No. 4 |
| Station No. 4 RX size | 1 ($1_H$) | Though the upper 8 bits of the buffer memory address $4018_H$ are the corresponding size of RX of station No. 4, 1 is stored since less than 1 word is rounded up. |
| Station No. 1 RY offset | $4200_H$ | Head buffer memory address of RY of station No. 1 |
| Station No. 1 RY size | 24 ($18_H$) | 384 (number of RY points) / 16 = 24 words |
| Station No. 2 RY offset | $4000_H$ | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 2 RY size | 0 (default) | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 3 RY offset | $4218_H$ | Head buffer memory address of RY of station No. 3 |
| Station No. 3 RY size | 1 ($1_H$) | Though the lower 8 bits of the buffer memory address $4218_H$ are the corresponding size of RY of station No. 3, 1 is stored since less than 1 word is rounded up. |
| Station No. 4 RY offset | $4218_H$ | Head buffer memory address of RY of station No. 4 |
| Station No. 4 RY size | 1 ($18_H$) | Though the upper 8 bits of the buffer memory address $4218_H$ are the corresponding size of RY of station No. 4, 1 is stored since less than 1 word is rounded up. |
| Station No. 1 RWw offset | $4400_H$ | Head buffer memory address of RWw of station No. 1 |
| Station No. 1 RWw size | 64 ($40_H$) | 2 (number of occupied stations) × 32 (expanded cyclic setting) = 64 |
| Station No. 2 RWw offset | $4400_H$ | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 2 RWw size | 0 (default) | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 3 RWw offset | $4440_H$ | Head buffer memory address of RWw of station No. 3 |
| Station No. 3 RWw size | 0 (default) | Buffer memory size of RWw of station No. 3 |
| Station No. 4 RWw offset | $4440_H$ | Head buffer memory address of RWw of station No. 4 |
| Station No. 4 RWw size | 0 (default) | Buffer memory size of RWw of station No. 4 |
| Station No. 1 RWr offset | $4C00_H$ | Head buffer memory address of RWr of station No. 1 |
| Station No. 1 RWr size | 64 ($40_H$) | 2 (number of occupied stations) × 32 (expanded cyclic setting) = 64 |
| Station No. 2 RWr offset | $4C00_H$ | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 2 RWr size | 0 (default) | As 2 stations are occupied, the area of station No. 1 is checked. |
| Station No. 3 RWr offset | $4C40_H$ | Head buffer memory address of RWr of station No. 3 |
| Station No. 3 RWr size | 0 (default) | Buffer memory size of RWr of station No. 3 |
| Station No. 4 RWr offset | $4C40_H$ | Head buffer memory address of RWr of station No. 4 |
| Station No. 4 RWr size | 0 (default) | Buffer memory size of RWr of station No. 4 |

### (5) Link special relays (SB)

The link special relays store the data link status using bit ON/OFF data.
Buffer memory addresses 5E0H to 5FFH correspond to link special relays SB0000 to SB01FF.
For details on the link special relays (SB0000 to SB01FF), see Section 8.4.1.
The following table shows the relationship between buffer memory addresses 5E0H to 5FFH and link special relays SB0000 to SB01FF.

| Address | b15 | b14 | b13 | b12 | b11 | b10 | b9 | b8 | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5E0H | F | E | D | C | B | A | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 5E1H | 1F | 1E | 1D | 1C | 1B | 1A | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 |
| 5E2H | 2F | 2E | 2D | 2C | 2B | 2A | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 |
| 5E3H | 3F | 3E | 3D | 3C | 3B | 3A | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 |
| 5E4H | 4F | 4E | 4D | 4C | 4B | 4A | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 |
| 5E5H | 5F | 5E | 5D | 5C | 5B | 5A | 59 | 58 | 57 | 56 | 55 | 54 | 53 | 52 | 51 | 50 |
| 5E6H | 6F | 6E | 6D | 6C | 6B | 6A | 69 | 68 | 67 | 66 | 65 | 64 | 63 | 62 | 61 | 60 |
| 5E7H | 7F | 7E | 7D | 7C | 7B | 7A | 79 | 78 | 77 | 76 | 75 | 74 | 73 | 72 | 71 | 70 |
| 5E8H | 8F | 8E | 8D | 8C | 8B | 8A | 89 | 88 | 87 | 86 | 85 | 84 | 83 | 82 | 81 | 80 |
| 5E9H | 9F | 9E | 9D | 9C | 9B | 9A | 99 | 98 | 97 | 96 | 95 | 94 | 93 | 92 | 91 | 90 |
| 5EAH | AF | AE | AD | AC | AB | AA | A9 | A8 | A7 | A6 | A5 | A4 | A3 | A2 | A1 | A0 |
| 5EBH | BF | BE | BD | BC | BB | BA | B9 | B8 | B7 | B6 | B5 | B4 | B3 | B2 | B1 | B0 |
| 5ECH | CF | CE | CD | CC | CB | CA | C9 | C8 | C7 | C6 | C5 | C4 | C3 | C2 | C1 | C0 |
| 5EDH | DF | DE | DD | DC | DB | DA | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 5EEH | EF | EE | ED | EC | EB | EA | E9 | E8 | E7 | E6 | E5 | E4 | E3 | E2 | E1 | E0 |
| 5EFH | FF | FE | FD | FC | FB | FA | F9 | F8 | F7 | F6 | F5 | F4 | F3 | F2 | F1 | F0 |
| 5F0H | 10F | 10E | 10D | 10C | 10B | 10A | 109 | 108 | 107 | 106 | 105 | 104 | 103 | 102 | 101 | 100 |
| 5F1H | 11F | 11E | 11D | 11C | 11B | 11A | 119 | 118 | 117 | 116 | 115 | 114 | 113 | 112 | 111 | 110 |
| 5F2H | 12F | 12E | 12D | 12C | 12B | 12A | 129 | 128 | 127 | 126 | 125 | 124 | 123 | 122 | 121 | 120 |
| 5F3H | 13F | 13E | 13D | 13C | 13B | 13A | 139 | 138 | 137 | 136 | 135 | 134 | 133 | 132 | 131 | 130 |
| 5F4H | 14F | 14E | 14D | 14C | 14B | 14A | 149 | 148 | 147 | 146 | 145 | 144 | 143 | 142 | 141 | 140 |
| 5F5H | 15F | 15E | 15D | 15C | 15B | 15A | 159 | 158 | 157 | 156 | 155 | 154 | 153 | 152 | 151 | 150 |
| 5F6H | 16F | 16E | 16D | 16C | 16B | 16A | 169 | 168 | 167 | 166 | 165 | 164 | 163 | 162 | 161 | 160 |
| 5F7H | 17F | 17E | 17D | 17C | 17B | 17A | 179 | 178 | 177 | 176 | 175 | 174 | 173 | 172 | 171 | 170 |
| 5F8H | 18F | 18E | 18D | 18C | 18B | 18A | 189 | 188 | 187 | 186 | 185 | 184 | 183 | 182 | 181 | 180 |
| 5F9H | 19F | 19E | 19D | 19C | 19B | 19A | 199 | 198 | 197 | 196 | 195 | 194 | 193 | 192 | 191 | 190 |
| 5FAH | 1AF | 1AE | 1AD | 1AC | 1AB | 1AA | 1A9 | 1A8 | 1A7 | 1A6 | 1A5 | 1A4 | 1A3 | 1A2 | 1A1 | 1A0 |
| 5FBH | 1BF | 1BE | 1BD | 1BC | 1BB | 1BA | 1B9 | 1B8 | 1B7 | 1B6 | 1B5 | 1B4 | 1B3 | 1B2 | 1B1 | 1B0 |
| 5FCH | 1CF | 1CE | 1CD | 1CC | 1CB | 1CA | 1C9 | 1C8 | 1C7 | 1C6 | 1C5 | 1C4 | 1C3 | 1C2 | 1C1 | 1C0 |
| 5FDH | 1DF | 1DE | 1DD | 1DC | 1DB | 1DA | 1D9 | 1D8 | 1D7 | 1D6 | 1D5 | 1D4 | 1D3 | 1D2 | 1D1 | 1D0 |
| 5FEH | 1EF | 1EE | 1ED | 1EC | 1EB | 1EA | 1E9 | 1E8 | 1E7 | 1E6 | 1E5 | 1E4 | 1E3 | 1E2 | 1E1 | 1E0 |
| 5FFH | 1FF | 1FE | 1FD | 1FC | 1FB | 1FA | 1F9 | 1F8 | 1F7 | 1F6 | 1F5 | 1F4 | 1F3 | 1F2 | 1F1 | 1F0 |

### (6) Link special registers (SW)

The link special registers store the data link status using word data.
Buffer memory addresses 600H to 7FFH correspond to link special registers SW0000 to SW01FF.
For more details on the link special registers (SW0000 to SW01FF), see Section 8.4.2.

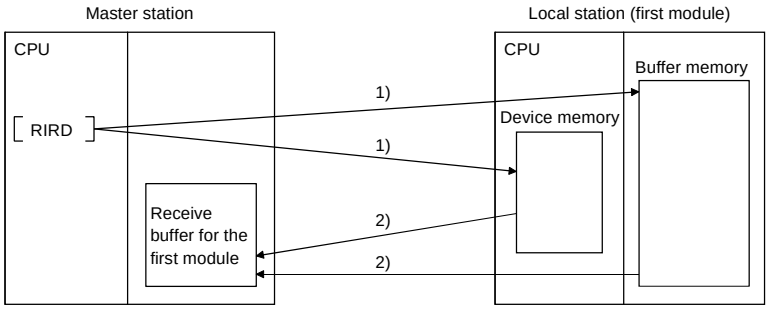
### (7) Random access buffer

The random access buffer stores any data to be sent to other stations.
The reading and writing of data are performed using transient transmission.

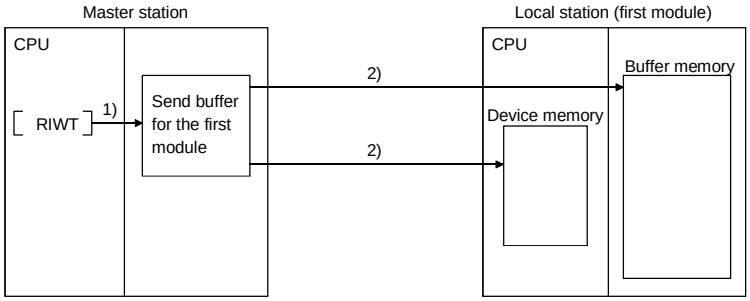
### (8) Communication buffer

The communication buffers stores the send and receive data when performing transient transmission (communication using the communication buffers) between the local stations, standby master station, and intelligent device stations.
The communication buffer sizes for the local station, standby master station, and intelligent device station are set with network parameters.
For more details on the communication buffer size settings, see Section 6.2.

[Example of communication using the communication buffers]




1) Accesses the buffer memory of the local station or the device memory of the CPU.
2) Stores the data specified by the control data in the receive buffer for the first module.




1) Stores the data to be written in the buffer memory of the local station or to the device memory of the CPU in the send buffer for the first module.
2) Accesses the buffer memory of the local station or the device memory of the CPU.

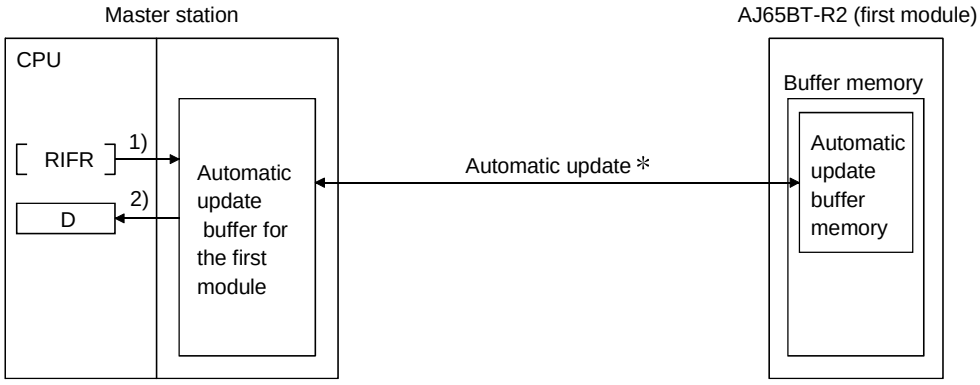
### (9) Automatic update buffer

The automatic update buffer stores automatic update data when performing transient transmission (communication using the automatic update buffer) with the AJ65BT-R2.

The automatic update buffer size of the AJ65BT-R2 is specified by a network parameter.

For more details on the automatic update buffer size settings, see Section 6.2.

[Communication example using the automatic update buffer]




1) Accesses the automatic update buffer for the first module.
2) Stores the data specified by the control data in the CPU device.

＊ For details on the automatic update timing, see AJ65BT-R2 Type RS-232C Interface Module User's Manual.


8 - 21

### (10) Ver.2 compatible remote input (RX) and Ver.2 compatible remote output (RY)

Used when the remote net ver. 2 mode or remote net additional mode is selected.

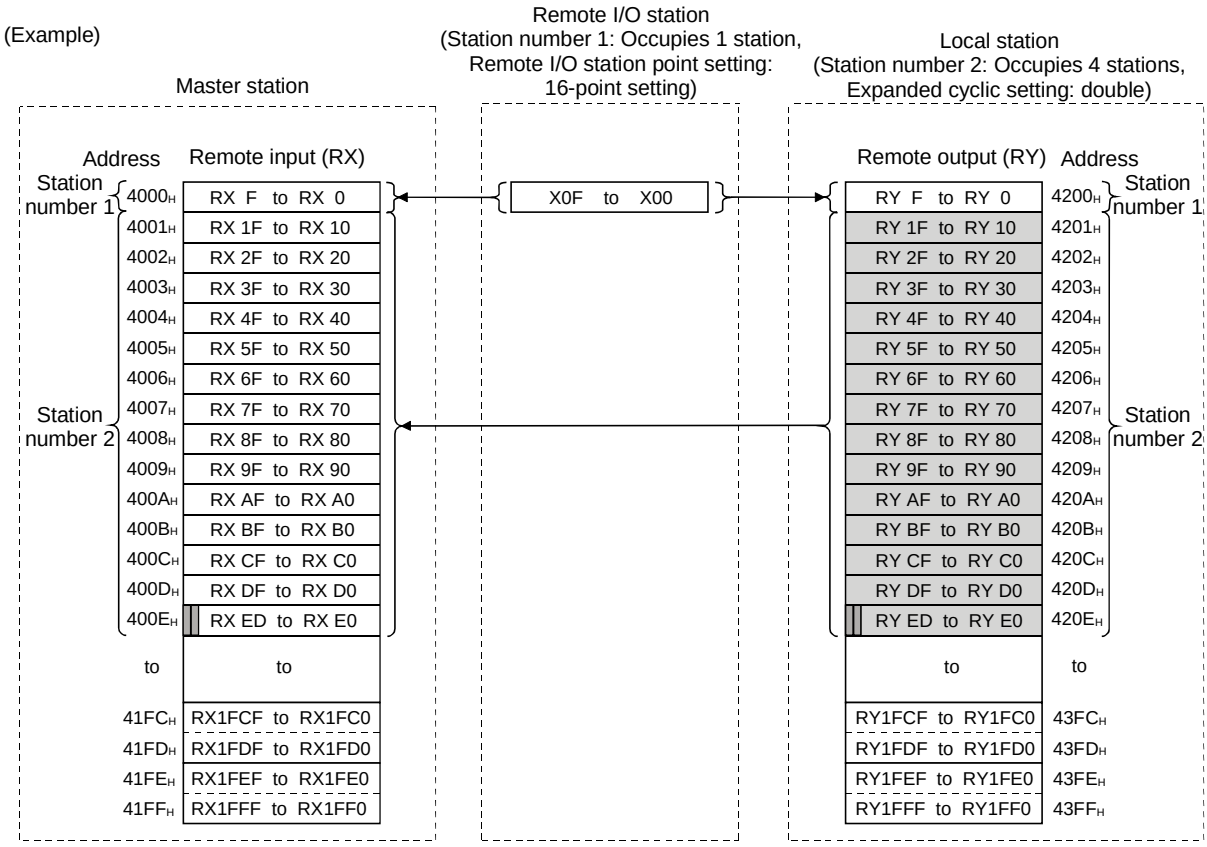
(a) Master station ← remote I/O station/remote device station/local station

1) Master station
- The input status from the remote I/O station, remote device station (RX) and local station (RY) is stored.
- When 1 station is occupied, 2, 4 or 8 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

2) Local station
- Data to be sent to the master station is stored in the remote output (RY) of the address corresponding to the host station number.
- The input status from the remote I/O station, remote device station (RX) and other local station is stored.
- When 1 station is occupied, any of 2 to 8 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

▯ ... The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RYEE and RYEF cannot be used.)

(Example)


Master station
Remote I/O station
(Station number 1: Occupies 1 station,
Remote I/O station point setting:
16-point setting)
Local station
(Station number 2: Occupies 4 stations,
Expanded cyclic setting: double)
Address
Remote input (RX)
Remote output (RY)
Address
Station number 1
Station number 2
4000H RX F to RX 0
4001H RX 1F to RX 10
4002H RX 2F to RX 20
4003H RX 3F to RX 30
4004H RX 4F to RX 40
4005H RX 5F to RX 50
4006H RX 6F to RX 60
4007H RX 7F to RX 70
4008H RX 8F to RX 80
4009H RX 9F to RX 90
400AH RX AF to RX A0
400BH RX BF to RX B0
400CH RX CF to RX C0
400DH RX DF to RX D0
400EH RX ED to RX E0
to
41FCH RX1FCF to RX1FC0
41FDH RX1FDF to RX1FD0
41FEH RX1FEF to RX1FE0
41FFH RX1FFF to RX1FF0
X0F to X00
4200H RY F to RY 0
4201H RY 1F to RY 10
4202H RY 2F to RY 20
4203H RY 3F to RY 30
4204H RY 4F to RY 40
4205H RY 5F to RY 50
4206H RY 6F to RY 60
4207H RY 7F to RY 70
4208H RY 8F to RY 80
4209H RY 9F to RY 90
420AH RY AF to RY A0
420BH RY BF to RY B0
420CH RY CF to RY C0
420DH RY DF to RY D0
420EH RY ED to RY E0
to
43FCH RY1FCF to RY1FC0
43FDH RY1FDF to RY1FD0
43FEH RY1FEF to RY1FE0
43FFH RY1FFF to RY1FF0

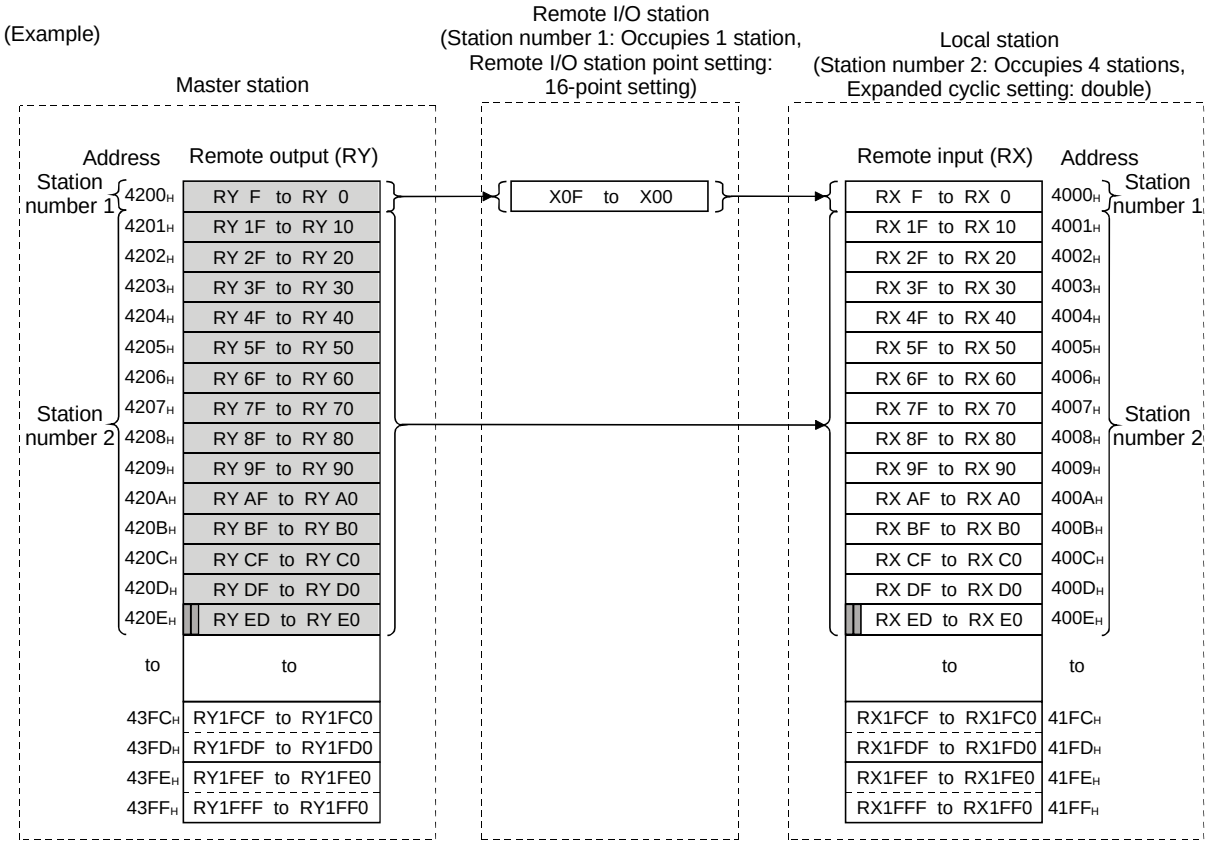
(b) Master station → remote I/O station/remote device station/local station

1) Master station
   - The output status to the remote I/O station, remote device station (RY) and all local stations (RX) is stored.
   - When 1 station is occupied, 2, 4 or 8 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

2) Local station
   - The data received from the remote I/O station, remote device station (RY) and master station (RY) is stored.
   - When 1 station is occupied, any of 2 to 8 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

▥ … The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RYEE and RYEF cannot be used.)

(Example)



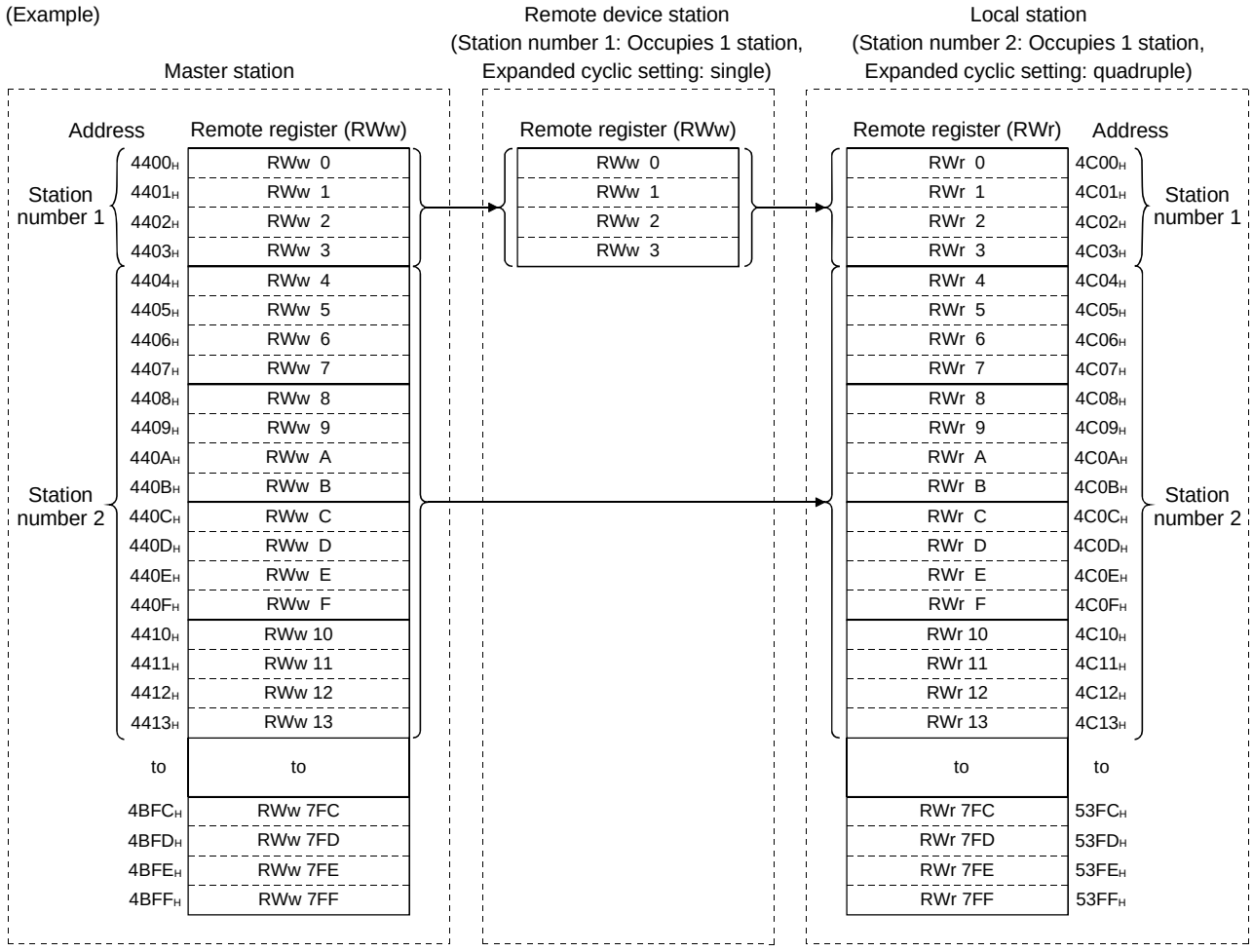
### (11) Ver.2 compatible remote registers (RWw) and (RWr)

Used when the remote net ver. 2 mode or remote net additional mode is selected.

(a) Master station (RWw) → remote device station (RWw)/local station (RWr)

1) Master station
   - The data to be sent to the remote register (RWw) of the remote device station and the remote registers (RWr) of all local stations are stored.
   - When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

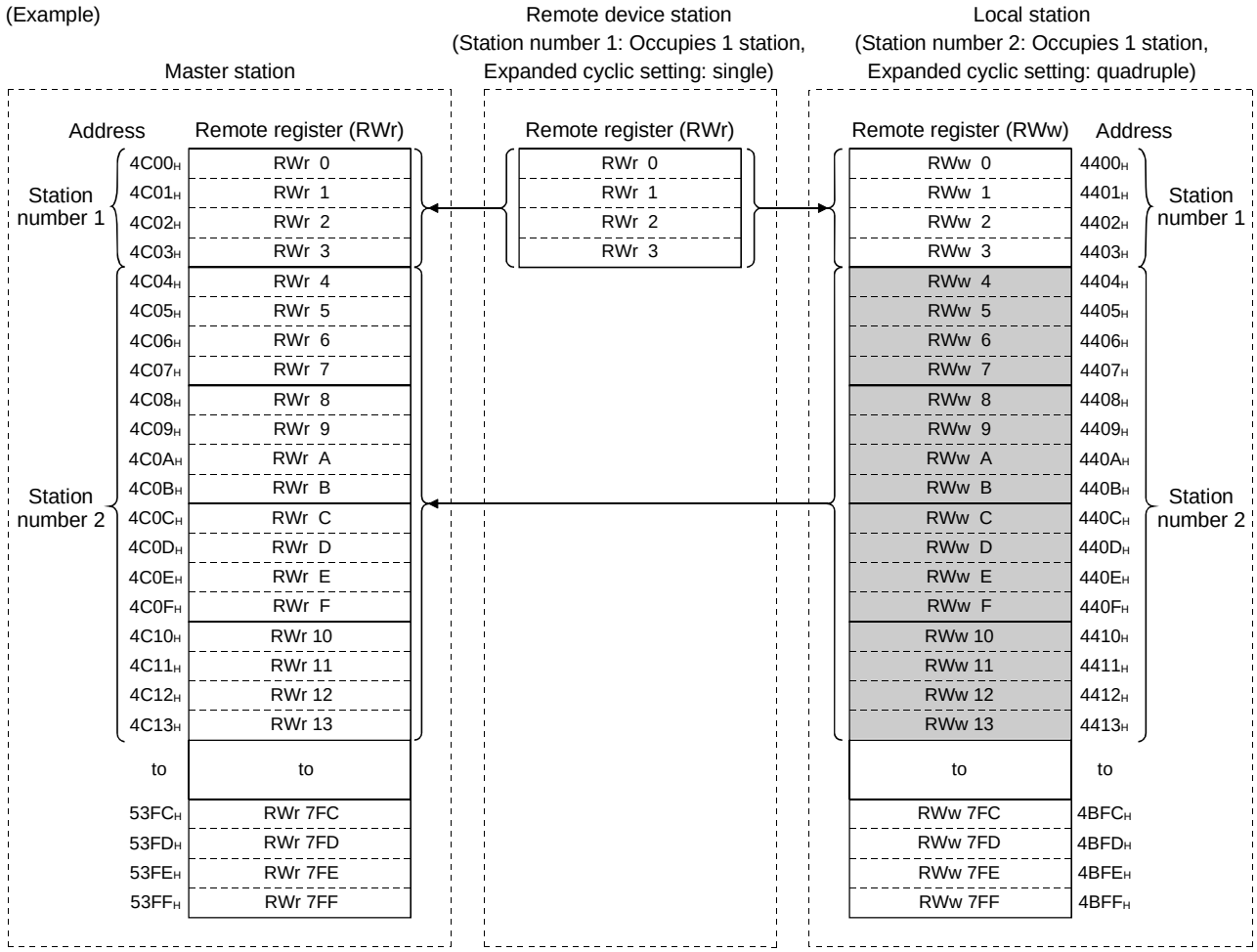
2) Local station
   - The data sent to the remote register (RWw) of the remote device station can also be received.
   - When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)



(b) Master station (RWr) ← remote device station (RWr)/local station (RWw)

1) Master station
   - The send data from the remote register (RWr) of the remote device station and the remote register (RWw) of the local station is stored.
   - When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

2) Local station
   - Data is sent to the master station and other local stations by storing it in the address corresponding to the host station number.
   - Data in the remote register (RWr) of the remote device station can also be received.
   - When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)



## 8.4 Link Special Relays and Registers (SB/SW)

The data link status can be checked with bit data (link special relays: SB) and word data (link special registers: SW).
The SB and SW represent the information in the buffer memory of the master/local module, which is used by reading to the device specified in an automatic refresh parameter.

- Link special relays (SB) : Buffer memory addresses $5E0_H$ to $5FF_H$
- Link special registers (SW): Buffer memory addresses $600_H$ to $7FF_H$

### 8.4.1 Link special relays (SB)

Link special relays SB0000 to SB001F are turned ON/OFF by the sequence program, and SB0020 to SB01FF are automatically turned ON/OFF.
The values in parentheses in the number column indicate the buffer memory address.
When the standby master station is controlling the data link, the availability of the link's special relays is basically identical to that of the master station.
When the standby master station is operating as a local station, the availability of the link's special relays is identical to that of a local station.
For the correspondence with the buffer memory, see Section 8.3.2 (5).

Table 8.5 Link special relay list (1/5)

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB0000 ($5E0_H$, b0) | Data link restart | Restarts the data link that had been stopped by SB0002.<br>OFF: Restart not instructed<br>ON : Restart instructed | ○ | ○ | × |
| SB0001 ($5E0_H$, b1) | Refresh instruction at standby master switching | Instructs to perform cyclic data refresh after the data link control is transferred to the standby master station.<br>OFF: Not instructed<br>ON : Instructed | ○ | × | × |
| SB0002 ($5E0_H$, b2) | Data link stop | Stops the host data link.<br>However, when the master station executes this, the entire system will stop.<br>OFF: No stop instruction<br>ON : Stop instructed | ○ | ○ | × |
| SB0003 ($5E0_H$, b3) | Refresh instruction when changing parameters by the dedicated instruction | Instructs to refresh cyclic data after changing parameters by the RLPASET instruction.<br>OFF: Not instructed (stop refreshing)<br>ON : Instructed (start/continue refreshing) | ○ | ○ | × |
| SB0004 ($5E0_H$, b4) | Temporary error invalid request | Establishes the stations specified by SW0003 to SW0007 as temporary error invalid stations.<br>OFF: Not requested<br>ON : Requested | ○ | × | × |
| SB0005 ($5E0_H$, b5) | Temporary error invalid canceling request | Cancels the temporary error invalid status of stations specified by SW0003 to SW0007.<br>OFF: Not requested<br>ON : Requested | ○ | × | × |
| SB0008 ($5E0_H$, b8) | Line test request | Executes line tests for the stations specified by SW0008.<br>OFF: Not requested<br>ON : Requested | ○ | × | × |
| SB0009 ($5E0_H$, b9) | Parameter information read request | Reads the parameter setting information for the actual system configuration.<br>OFF: Normal<br>ON : Abnormal | ○ | × | × |

Table 8.5 Link special relay list (2/5)

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB000C (5E0H, b12) | Forced master switching | Forcefully transfers the data link control from the standby master station that is controlling the data link to the standby master station in case the standby master station becomes faulty.<br>OFF: Not requested<br>ON : Requested | ○ *2 | × | × |
| SB000D (5E0H, b13) | Remote device station initialization procedure registration instruction | Starts the initial processing using the information registered during the initialization procedure registration.<br>While SB000D is on, the refresh of the remote input/output and remote registers stops.<br>OFF: Not instructed<br>ON : Instructed | ○ *1 | × | × |
| SB0020 (5E2H, b0) | Module status | Indicates the module access (module operation) status.<br>OFF: Normal (Module is operating normally)<br>ON : Abnormal (Module error has occurred) | ○ | ○ | ○ |
| SB0040 (5E4H, b0) | Data link restart acceptance | Indicates the data link restart instruction acknowledgment status.<br>OFF: Not acknowledged<br>ON : Startup instruction acknowledged | ○ | ○ | × |
| SB0041 (5E4H, b1) | Data link restart complete | Indicates the data link restart instruction acknowledgment completion status.<br>OFF: Not complete<br>ON : Startup complete | ○ | ○ | × |
| SB0042 (5E4H, b2) | Refresh instruction acknowledgment status at standby master switching | Indicates whether or not the refresh instruction at standby master switching have been acknowledged.<br>OFF: Not executed<br>ON : Instruction acknowledged | ○ | × | × |
| SB0043 (5E4H, b3) | Refresh instruction complete status at standby master switching | Indicates whether or not the refresh instruction at standby master switching is complete.<br>OFF: Not executed<br>ON : Switching complete | ○ | × | × |
| SB0044 (5E4H, b4) | Data link stop acceptance | Indicates the data link stop instruction acknowledgment status.<br>OFF: Not acknowledged<br>ON : Stop instruction acknowledged | ○ | ○ | × |
| SB0045 (5E4H, b5) | Data link stop complete | Indicates the data link stop instruction acknowledgment completion status.<br>OFF: Not complete<br>ON : Stop complete | ○ | ○ | × |
| SB0046 (5E4H, b6) | Forced master switching executable status | Indicates whether the forced master switching (SB000C) signal can be executed or not.<br>OFF: Cannot be executed.<br>ON: Can be executed. | ○ *2 | × | × |
| SB0048 (5E4H, b8) | Temporary error invalid acceptance status | Indicates the acknowledgment status of remote station temporary error invalid instruction.<br>OFF: Not executed<br>ON : Instruction acknowledged | ○ | × | × |
| SB0049 (5E4H, b9) | Temporary error invalid complete status | Indicates the acknowledgment completion status of remote station temporary error invalid instruction.<br>OFF: Not executed<br>ON : Temporary error invalid station established/Specified station number is invalid | ○ | × | × |
| SB004A (5E4H, b10) | Temporary error invalid canceling acknowledgment status | Indicates the acknowledgment status of remote station temporary error invalid cancel instruction.<br>OFF: Not executed<br>ON : Instruction acknowledged | ○ | × | × |
| SB004B (5E4H, b11) | Temporary error invalid canceling complete status | Indicates the acknowledgment completion status of remote station temporary error invalid cancel instruction.<br>OFF: Not executed<br>ON : Temporary error invalid station cancellation complete | ○ | × | × |
| SB004C (5E4H, b12) | Line test acceptance status | Indicates the line test request acknowledgment status.<br>OFF: Not executed<br>ON : Instruction acknowledged | ○ | × | × |

*1: Can be used for the master station only.

*2: Can be used for the standby master station only.

Table 8.5 Link special relay list (3/5)

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB004D (5E4H, b13) | Line test complete status | Indicates the line test completion status.<br>OFF: Not executed<br>ON : Test complete | ○ | × | × |
| SB004E (5E4H, b14) | Parameter information read acknowledgment status | Indicates the parameter information read request acknowledgment status.<br>OFF: Not executed<br>ON : Instruction acknowledged | ○ | × | × |
| SB004F (5E4H, b15) | Parameter information read completion status | Indicates the completion status of the parameter information read request.<br>OFF: Not executed<br>ON : Test complete | ○ | × | × |
| SB0050 (5E5H, b0) | Offline test status | Indicates the offline test execution status.<br>OFF: Not executed<br>ON : In progress | × | × | ○ |
| SB005A (5E5H, b10) | Master switching request acknowledgment | Indicates the acknowledgment status of the standby master station when it has received a master switching request from the line.<br>OFF: Not acknowledged<br>ON : Request acknowledged | ○ | × | × |
| SB005B (5E5H, b11) | Master switching request complete | Indicates whether or not the switching from the standby master station to master station is complete.<br>OFF: Not complete<br>ON : Complete | ○ | × | × |
| SB005C (5E5H, b12) | Forced master switching request acknowledgment | Indicates whether or not a forced master switching request has been acknowledged.<br>OFF: Not acknowledged<br>ON : Instruction acknowledged | ○ *2 | × | × |
| SB005D (5E5H, b13) | Forced master switching request complete | Indicates whether or not a forced master switching request is complete.<br>OFF: Not complete<br>ON : Complete | ○ *2 | × | × |
| SB005E (5E5H, b14) | Execution status of remote device station initialization procedure | Indicates the execution status of the initialization procedure.<br>OFF: Not executed<br>ON : Being executed | ○ *1 | × | × |
| SB005F (5E5H, b15) | Completion status of remote device station initialization procedure | Indicates the completion status of the initialization procedure execution.<br>OFF: Not complete<br>ON : Complete | ○ *1 | × | × |
| SB0060 (5E6H, b0) | Host mode | Indicates the mode setting status of the transmission rate/mode setting switch for the host.<br>OFF: Online<br>ON : Other than online | ○ | ○ | ○ |
| SB0061 (5E6H, b1) | Host type | Indicates the station type of the host.<br>OFF: Master station (station number 0)<br>ON : Local station (station numbers 1 to 64) | ○ | ○ | × |
| SB0062 (5E6H, b2) | Host standby master station setting status | Indicates whether or not the standby master station setting exists for the host.<br>OFF: No setting<br>ON : Setting exists | ○ | ○ | ○ |
| SB0065 (5E6H, b5) | Input data status of host data link faulty station | Indicates the input status setting from a data link faulty station of the host.<br>OFF: Clear<br>ON : Retain | ○ | ○ | × |

*1: Can be used for the master station only.

*2: Can be used for the standby master station only.

Table 8.5 Link special relay list (4/5)

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB0066 (5E6H, b6)<br>SB0067 (5E6H, b7) | Number of host occupied stations | Indicates the setting status of host occupied stations.<br>Number of occupied station / SB0066 / SB0067<br>1 station: OFF / OFF<br>2 stations: OFF / ON<br>3 stations: ON / ON<br>4 stations: ON / OFF | × | ○ | × |
| SB006A (5E6H, b10) | Switch setting status | Indicates the switch setting status.<br>OFF: Normal<br>ON : Setting error exists (the error code is stored in SW006A) | ○ | ○ | ○ |
| SB006D (5E6H, b13) | Parameter setting status | Indicates the parameter setting status.<br>OFF: Normal<br>ON : Setting error exists (the error code is stored in SW0068) | ○ | ○ | × |
| SB006E (5E6H, b14) | Host station operation status | Indicates the host data link operation status.<br>OFF: Being executed<br>ON : Not executed | ○ | ○ | × |
| SB0070 (5E7H, b0) | Master station information | Indicates the data link status.<br>OFF: Data link control by the master station<br>ON : Data link control by the standby master station | ○ | ○ | × |
| SB0071 (5E7H, b1) | Standby master station information | Indicates whether or not a standby master station is present.<br>OFF: Not present<br>ON : Present | ○ | ○ | × |
| SB0072 (5E7H, b2) | Scan mode setting information | Indicates the scan mode setting information.<br>OFF: Asynchronous mode<br>ON : Synchronous mode | ○ | × | × |
| SB0073 (5E7H, b3) | Operation specification when CPU is down status | Indicates the operation specification status using a parameter when the CPU is down.<br>OFF: Stop<br>ON : Continue | ○ | × | × |
| SB0074 (5E7H, b4) | Reserved station specified status | Indicates the reserved station specification status using a parameter.<br>OFF: No specification<br>ON : Specification exists (information is stored in SW0074 to SW0077) | ○ | ○ | × |
| SB0075 (5E7H, b5) | Error invalid station specified status | Indicates the error invalid station specification status using a parameter.<br>OFF: No specification<br>ON : Specification exists (information is stored in SW0078 to SW007B) | ○ | ○ | × |
| SB0076 (5E7H, b6) | Temporary error invalid station setting information | Indicates whether there is a temporary error invalid station setting.<br>OFF: No setting<br>ON : Setting exists (information is stored in SW007C to SW007F) | ○ | ○ | × |
| SB0077 (5E7H, b7) | Parameter receive status | Indicates the parameter receive status from the master station.<br>OFF: Reception complete<br>ON : Reception not complete | × | ○ | × |
| SB0078 (5E7H, b8) | Host station switch change detection | Detects changes to the host setting switch during data linking.<br>OFF: No changes detected<br>ON : Changes detected | ○ | ○ | × |
| SB0079 (5E7H, b9) | Master station return specification information | Indicates whether the "Type" setting of the network parameters is set to "Master station" or "Master station (Duplex function)."<br>OFF: Master station<br>ON : Master station (Duplex function) | ○ | × | × |


8 - 29

Table 8.5 Link special relay list (5/5)

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB007B ($5E7_H$, b11) | Host master/standby master operation status | Indicates whether the host operates as the master or standby master station.<br>OFF: Operates as the master station (controlling data link)<br>ON : Operates as the standby master station (standby) | ○ | ○ | × |
| SB007C ($5E7_H$, b12) | Slave station refresh/compulsory clear setting status in case of PLC CPU STOP | Indicates the parameter-set slave station refresh/compulsory clear setting status in case of PLC CPU STOP.<br>OFF: Refresh<br>ON : Clears compulsorily | ○ | × | × |
| SB0080 ($5E8_H$, b0) | Other station data link status *3 | Indicates the communication status between remote/local/intelligent device/standby master stations.<br>OFF: All stations normal<br>ON : Faulty station exists (information is stored in SW0080 to SW0083) | ○ | ○ | × |
| SB0081 ($5E8_H$, b1) | Other station watchdog timer error status | Indicates the occurrence of a watchdog timer error in other stations.<br>OFF: No error<br>ON : Error occurrence. | ○ | ○ | × |
| SB0082 ($5E8_H$, b2) | Other station fuse blown status | Indicates the fuse blown occurrence status at other stations. (SW0088 to SW008B)<br>OFF: No error<br>ON : Error occurrence. | ○ | ○ | × |
| SB0083 ($5E8_H$, b3) | Other station switch change status | Detects changes in setting switches of other stations during data linking.<br>OFF: No change<br>ON : Change detected. | ○ | ○ | × |
| SB0090 ($5E9_H$, b0) | Host line status | Indicates the line status of the host.<br>OFF: Normal<br>ON : Abnormal (line disconnection) | × | ○ | × |
| SB0094 ($5E9_H$, b4) | Transient transmission status | Indicates whether there is a transient transmission error.<br>OFF: No error<br>ON : Error occurrence. | ○ | ○ | × |
| SB0095 ($5E9_H$, b5) | Master station transient transmission status | Indicates the transient transmission status of the master station.<br>OFF: Normal<br>ON : Abnormal | × | ○ | × |
| SB00B4 ($5EB_H$, b4) | Standby master station test result | Stores the test result of Line test 1/Line test 2.<br>OFF: Normal<br>ON : Abnormal | ○ | × | ○ |

*3: The other station data link status (SB0080) takes up to 6 seconds to turn on after a slave station connected to the master/local station becomes faulty.
The time to turn ON differs according to the system configuration, faulty status or other conditions.


8 - 30

## 8.4.2 Link special registers (SW)

Data is stored in the link special registers SW000 to SW001F by the sequence program, and data is automatically stored in SW0020 to SW01FF. The values in parentheses in the number column indicate the buffer memory addresses.
When the standby master station is controlling the data link, availability is basically identical to that of the master station.
When the standby master station is operating as a local station, availability is identical to that of a local station.

Table 8.6 Link special register list (1/8)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability<br>(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0003<br>(603H)</td><td>Multiple temporary error invalid station specification</td><td>Select whether multiple temporary error invalid stations are specified.<br>00 : Specifies multiple stations indicated by SW0004 to SW0007.<br>01 to 64: Specifies a single station from 1 to 64.<br>(The specified number indicates the station number of a temporary error invalid station.)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0004<br>(604H)<br>SW0005<br>(605H)<br>SW0006<br>(606H)<br>SW0007<br>(607H)</td><td>Temporary error invalid station specification ＊3</td><td>Specifies a temporary error invalid station.<br>0: Not specified as a temporary error invalid station<br>1: Specified as a temporary error invalid station<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0004</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0005</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0006</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0007</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0008<br>(608H)</td><td>Line test station setting</td><td>Sets the station for which line tests are executed.<br>0 : Entire system (executed for all stations)<br>01 to 64 : Specified station only<br>Default value: 0</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0009<br>(609H)</td><td>Monitoring time setting</td><td>Sets the monitoring time when a dedicated instruction is used.<br>Default value: 10 (seconds)<br>Setting range: 0 to 360 (seconds)<br>The monitoring time of 360 seconds will be used if a value outside of the above setting range is specified.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW000A<br>(60AH)</td><td>CPU monitoring time setting</td><td>Sets the CPU response monitoring time when the CPU is accessed with a dedicated instruction.<br>Default value: 90 (seconds)<br>Setting range: 0 to 3600 (seconds)<br>The monitoring time of 3600 seconds will be used if a value outside of the above setting range is specified.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0020<br>(620H)</td><td>Module status</td><td>Indicates the module status.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3).</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW0041<br>(641H)</td><td>Data link restart result</td><td>Stores the execution result of the data link restart instruction with SB0000.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0043<br>(643H)</td><td>Refresh instruction at standby master switching result</td><td>Indicates the execution result of refresh instruction at standby master switching.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3).</td><td>○</td><td>×</td><td>×</td></tr>
</table>

＊3: Only the bit for the first station number is turned on.

Table 8.6 Link special register list (2/8)

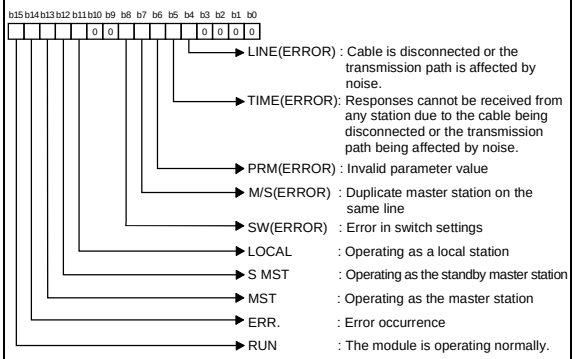
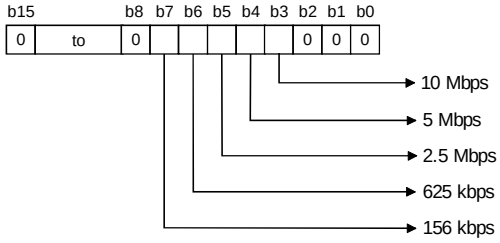
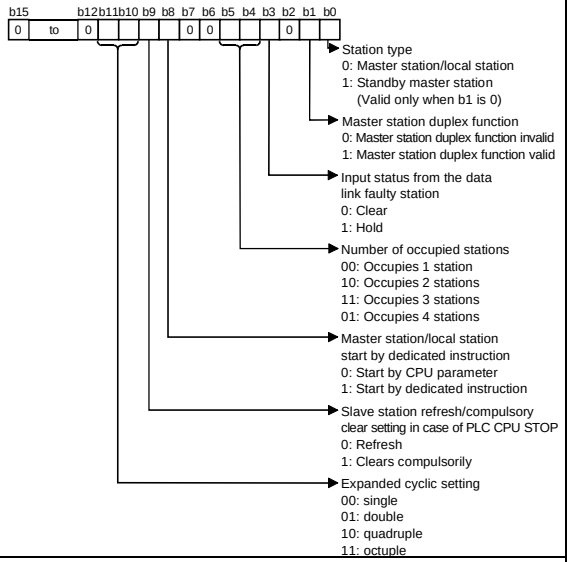
| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SW0045 (645H) | Data link stop result | Stores the execution result of the data-link stop instruction with SB0002.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | ○ | × |
| SW0049 (649H) | Temporary error invalid station specification result | Indicates the execution result of temporary error invalid station specification.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | × | × |
| SW004B (64BH) | Temporary error invalid station specification cancel result | Indicates the execution result of the temporary error invalid station specification cancellation.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | × | × |
| SW004D (64DH) | Line test result | Indicates the execution result of the line test.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | × | × |
| SW004F (64FH) | Parameter setting test result | Indicates the execution result of the parameter setting test.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | × | × |
| SW0052 (652H) | Automatic CC-Link startup execution result | Stores the system configuration check result when a new station is added to a system using an automatic CC-Link startup.<br>0: Normal<br>Other than 0: Stores the error code (see Section 13.3.) | ○ | × | × |
| SW0058 (658H) | Detailed LED display status | Stores the details of the LED display status.<br>0: OFF<br>1: ON<br>  | ○ | ○ | ○ |
| SW0059 (659H) | Transmission rate setting | Stores the contents of the transmission rate setting.<br>0: Cancel<br>1: Set<br>  | ○ | ○ | ○ |

Table 8.6 Link special register list (3/8)

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SW005D (65DH) | Forced master switching instruction result | Stores the execution result of the forced master switching instruction with SB000C.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ *2 | × | × |
| SW005F (65FH) | Remote device station initialization procedure registration instruction result | Stores the execution result of the initialization procedure registration instruction with SB000B.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ *1 | × | × |
| SW0060 (660H) | Mode setting status | Stores the mode setting status.<br>0: Online (Remote net mode)<br>1: Online (Remote I/O net mode)<br>2: Offline<br>3: Line test 1<br>4: Line test 2<br>6: Hardware test | ○ | ○ | ○ |
| SW0061 (661H) | Host station number | Stores the station number of the host that is currently in operation.<br>0 : Master station<br>1 to 64: Local station | ○ | ○ | ○ |
| SW0062 (662H) | Module operating status | Stores the operation setting status of the module.<br>  | ○ | ○ | ○ |
| SW0064 (664H) | No. of retries information | Indicates the retry count setting information when there is an error response.<br>1 to 7 (times) | ○ | × | × |
| SW0065 (665H) | No. of automatic return stations | Indicates the setting information for the number of automatic return stations during one link scan.<br>1 to 10 (stations) | ○ | × | × |
| SW0066 (666H) | Delay timer information | Indicates the delay time setting information. | ○ | × | × |
| SW0067 (667H) | Parameter information | Stores the parameter information area to be used.<br>0H: CPU built-in parameters<br>3H: Dedicated instruction (parameter setting with the RLPASET instruction and data link startup.)<br>DH: Default parameters (automatically starts CC-Link) | ○ | × | ○ |
| SW0068 (668H) | Host parameter status | Stores the parameter setting status.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3). | ○ | ○ | × |
| SW0069 (669H) | Loading status *4 | Stores the duplicate station number status and parameter matching of each station.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3).<br>Details are stored in SW0098 to 9B and SW009C to 9F. | ○ | × | × |

*1: Can be used for the master station only.
*2: Can be used for the standby master station only.
*4: This register checks and stores the status only at link startup.

Table 8.6 Link special register list (4/8)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability<br>(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW006A<br>(66A<sub>H</sub>)</td><td>Switch setting status</td><td>Stores the switch setting status.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3).</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW006D<br>(66D<sub>H</sub>)</td><td>Max. link scan time</td><td>Stores the maximum value of the link scan time (in 1 ms units).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006E<br>(66E<sub>H</sub>)</td><td>Current link scan time</td><td>Stores the current value of the link scan time (in 1 ms units).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006F<br>(66F<sub>H</sub>)</td><td>Min. link scan time</td><td>Stores the minimum value of the link scan time (in 1 ms units).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0070<br>(670<sub>H</sub>)</td><td>Total number of stations</td><td>Stores the final station number set in the parameter.<br>1 to 64 (stations)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0071<br>(671<sub>H</sub>)</td><td>Max. communication station number</td><td>Stores the maximum station number (setting of the station number setting switch) that is performing data link.<br>1 to 64 (stations)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0072<br>(672<sub>H</sub>)</td><td>Number of connected modules</td><td>Stores the number of modules that are performing data link.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0073<br>(673<sub>H</sub>)</td><td>Standby master station number</td><td>Stores the station number of the standby master station.<br>1 to 64 (stations)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0074<br>(674<sub>H</sub>)<br>SW0075<br>(675<sub>H</sub>)<br>SW0076<br>(676<sub>H</sub>)<br>SW0077<br>(677<sub>H</sub>)</td><td>Reserved station specified status ＊3</td><td>Stores the reserved station setting status.<br>0: Not reserved station<br>1: Reserved station<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0074</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0075</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0076</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0077</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0078<br>(678<sub>H</sub>)<br>SW0079<br>(679<sub>H</sub>)<br>SW007A<br>(67A<sub>H</sub>)<br>SW007B<br>(67B<sub>H</sub>)</td><td>Error invalid station specified status ＊3</td><td>Stores the error invalid station setting status.<br>0: Other than error invalid station<br>1: Error invalid station<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0078</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0079</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

＊3: Only the bit for the first station number is turned on.

Table 8.6 Link special register list (5/8)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability<br>(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW007C<br>(67CH)<br>SW007D<br>(67DH)<br>SW007E<br>(67EH)<br>SW007F<br>(67FH)</td><td>Temporary error invalid status ＊6</td><td>Indicates the temporary error invalid status.<br>0: Normal status<br>1: Temporary error invalid status<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW007C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW007D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0080<br>(680H)<br>SW0081<br>(681H)<br>SW0082<br>(682H)<br>SW0083<br>(683H)</td><td>Other station data link status ＊6 ＊8</td><td>Stores the data link status of each station.<br>0: Normal<br>1: Data link error occurrence<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0080</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0081</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0082</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0083</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0084<br>(684H)<br>SW0085<br>(685H)<br>SW0086<br>(686H)<br>SW0087<br>(687H)</td><td>Other station watchdog timer error occurrence status ＊3</td><td>Indicates the watchdog timer error occurrence status.<br>0: No watchdog timer error<br>1: Watchdog timer error occurrence<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0084</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0085</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0086</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0087</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

＊3: Only the bit for the first station number is turned on.

＊6: Bits for the number of occupied stations are turned on.

＊8: The other station data link status (SW0080 to SW0083) takes up to 6 seconds to turn on after a slave station connected to the master/local station becomes faulty.
The time to turn ON differs according to the system configuration, faulty status or other conditions.

Table 8.6 Link special register list (6/8)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability<br>(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0088 (688H)<br>SW0089 (689H)<br>SW008A (68AH)<br>SW008B (68BH)</td><td>Other station fuse blown status *6</td><td>Stores the fuse blown occurrence status of each station.<br>0: Normal<br>1: Abnormal<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW008C (68CH)<br>SW008D (68DH)<br>SW008E (68EH)<br>SW008F (68FH)</td><td>Other station switch change status *3</td><td>Indicates the switch change status of other stations performing data link.<br>0: No change<br>1: Change occurred<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW008C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW008D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0090 (690H)</td><td>Line status</td><td>Stores the line status.<br>0: Normal<br>1: Data link cannot be performed (disconnected)</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SW0094 (694H)<br>SW0095 (695H)<br>SW0096 (696H)<br>SW0097 (697H)</td><td>Transient transmission status *3</td><td>Indicates the occurrence status of a transient transmission error.<br>0: No transient transmission error<br>1: Transient transmission error occurrence<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0094</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0095</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0096</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0097</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

*3: Only the bit for the first station number is turned on.

*6: Bits for the number of occupied stations are turned on.

Table 8.6 Link special register list (7/8)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability<br>(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0098 (698H)<br>SW0099 (699H)<br>SW009A (69AH)<br>SW009B (69BH)</td><td>Station number overlap status ＊7</td><td>Stores the overlap status when the first station number of each module is not overlapped.<br>0: Normal<br>1: Overlap station number (first station number only)<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0098</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0099</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW009C (69CH)<br>SW009D (69DH)<br>SW009E (69EH)<br>SW009F (69FH)</td><td>Loading/parameter consistency status ＊7</td><td>Stores the consistency status between the loaded station and the parameter settings.<br>A matching error occurs in any of the following cases.<br>1) Station type mismatch ＊<br>2) Number of occupied stations mismatch<br>3) Expanded cyclic setting mismatch ＊<br>4) CC-Link compatible version mismatch<br>＊ A matching error will not occur when installation ≤ parameter. (For example, a matching error will not occur when a remote device station is installed and the parameter setting is an intelligent device station.)<br>0: Normal<br>1: Matching error<br>Example of matching error<br><table><tr><th>Installation</th><th>Parameter</th></tr><tr><td>Remote device station</td><td>Remote I/O station</td></tr><tr><td rowspan="2">Intelligent device station</td><td>Remote I/O station</td></tr><tr><td>Remote device station</td></tr></table><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW009C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW009D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW00B4 (6B4H)<br>SW00B5 (6B5H)<br>SW00B6 (6B6H)<br>SW00B7 (6B7H)</td><td>Line test 1 result ＊6</td><td>Stores the line test 1 result.<br>0: Normal<br>1: Abnormal<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00B4</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00B5</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00B6</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00B7</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>○</td></tr>
<tr><td>SW00B8 (6B8H)</td><td>Line test result</td><td>Stores the line test 1/line test 2 result.<br>0 : Normal<br>Other than 0: Stores the error code (see Section 13.3).</td><td>×</td><td>×</td><td>○</td></tr>
</table>

＊6: Bits for the number of occupied stations are turned on.

＊7: Only the bit for the first station number is turned on. In addition, these registers check and store the status at link startup.


8 - 37

Table 8.6 Link special register list (8/8)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability<br>(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0140 (740H)<br>SW0141 (741H)<br>SW0142 (742H)<br>SW0143 (743H)</td><td>Compatible CC-Link ver. information ＊7</td><td>Indicates the slave stations compatible with CC-Link ver. 2.<br>0: Ver.1compatible slave station<br>1: Ver.2compatible slave station<br><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0140</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0141</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0142</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0143</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0144 (744H)<br>SW0145 (745H)<br>SW0146 (746H)<br>SW0147 (747H)</td><td>CC-Link ver. installation/parameter matching status ＊7</td><td>Stores the CC-Link version matching status of the parameters and slave stations.<br>0: Normal<br>1: Matching error<br>Example of matching error<br><table><tr><th>Installation</th><th>Parameter</th></tr><tr><td>Ver.2compatible remote device station</td><td>Ver.1compatible remote device station</td></tr><tr><td>Ver.1compatible remote device station</td><td>Ver.2compatible remote device station</td></tr></table><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0144</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0145</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0146</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0147</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0148 (748H)</td><td>Parameter mode</td><td>Indicates in which mode the system is operating.<br>0: Remote net ver.1 mode<br>1: Remote net additional mode<br>2: Remote net ver.2 mode</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0149 (749H)</td><td>Host parameter mode</td><td>Indicates in which mode the host is operating.<br>0: Remote net ver.1 mode<br>1: Remote net additional mode<br>2: Remote net ver.2 mode</td><td>○</td><td>○</td><td>○</td></tr>
</table>

＊7: Only the bit for the first station number is turned on. In addition, these registers check and store the status at link startup.

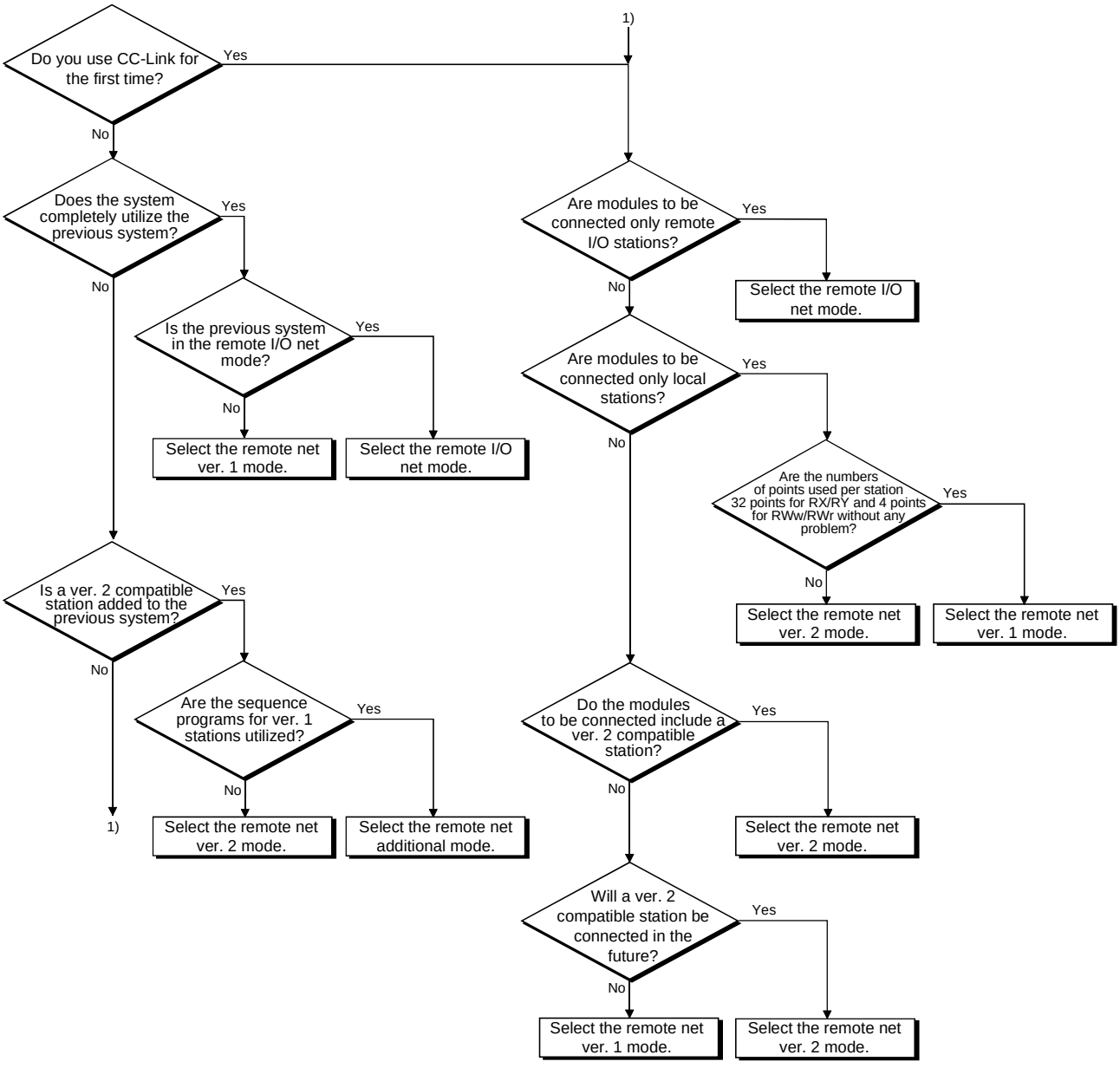
The timing when the data in a link special register (SW) is updated differs depending on the link register number.
Table 8.7 lists the update timings of link special registers.

Table 8.7 Update timing of the link special registers

| Link special register | Data update timing | Link special register | Data update timing |
|---|---|---|---|
| SW0041 | Updated independently regardless of SB | SW0071 | Updated independently regardless of SB (Update after each station is stabilized.) |
| SW0045 | | SW0072 | |
| SW0060 | When SB0060 changes | SW0074 to SW0077 | When SB0074 changes |
| SW0061 | When SB0061 changes | SW0078 to SW007B | When SB0075 changes |
| SW0062 | Updated independently regardless of SB | SW0080 to SW0083 | When SB0080 changes |
| SW0067 | | SW0088 to SW008B | Updated independently regardless of SB |
| SW0068 | | SW0090 | When SB0090 changes |
| SW0069 | | SW0098 to SW009B | Updated independently regardless of SB |
| SW006A | | SW009C to SW009F | |
| SW006D | | SW00B4 to SW00B7 | |
| SW006E | | SW00B8 | |
| SW006F | | SW00B9 | |
| SW0070 | | —— | —— |

## 8.5 Mode Selection Method

Four different modes are available for CC-Link to be applicable to various systems.
The following flowchart explains the points of mode selection.


Do you use CC-Link for the first time?
Yes
No
1)
Does the system completely utilize the previous system?
Yes
No
Is the previous system in the remote I/O net mode?
Yes
No
Select the remote net ver. 1 mode.
Select the remote I/O net mode.
Is a ver. 2 compatible station added to the previous system?
Yes
No
Are the sequence programs for ver. 1 stations utilized?
Yes
No
Select the remote net ver. 2 mode.
Select the remote net additional mode.
1)
Are modules to be connected only remote I/O stations?
Yes
No
Select the remote I/O net mode.
Are modules to be connected only local stations?
Yes
No
Are the numbers of points used per station 32 points for RX/RY and 4 points for RWw/RWr without any problem?
Yes
No
Select the remote net ver. 2 mode.
Select the remote net ver. 1 mode.
Do the modules to be connected include a ver. 2 compatible station?
Yes
No
Select the remote net ver. 2 mode.
Will a ver. 2 compatible station be connected in the future?
Yes
No
Select the remote net ver. 1 mode.
Select the remote net ver. 2 mode.

# 9 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE I/O STATIONS

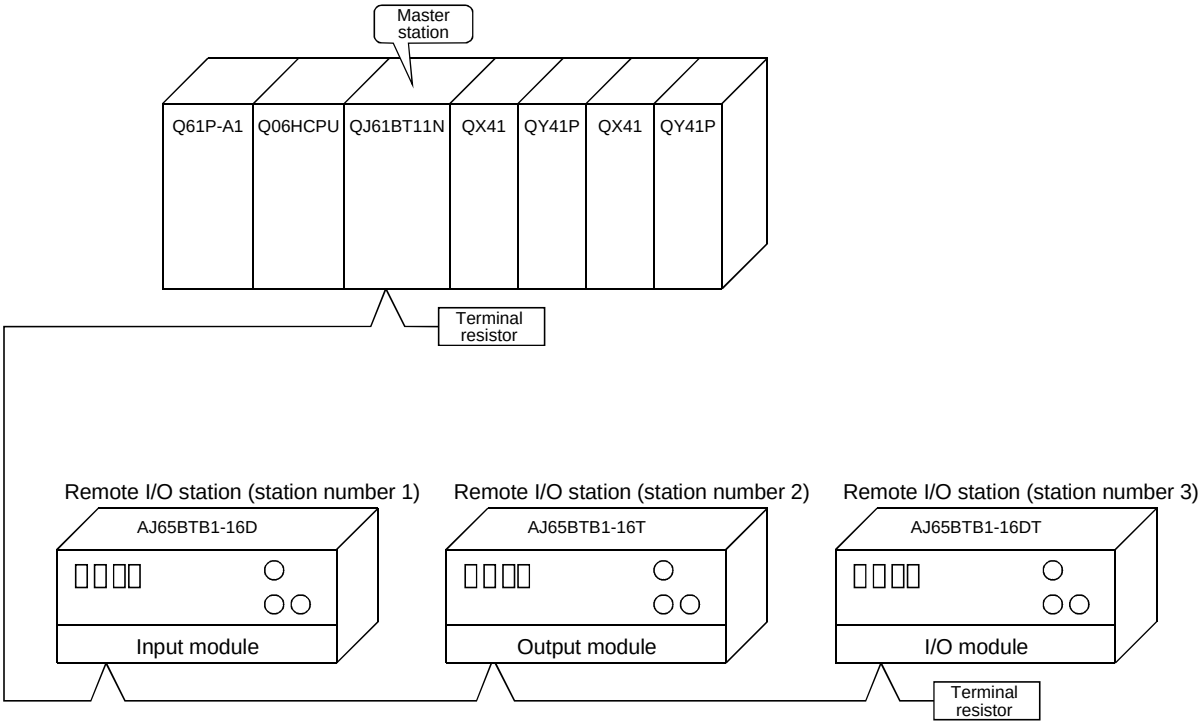
This chapter explains the procedures from module settings to parameter settings, programming, and finally operation check using a system configuration example.

## 9.1 When Remote I/O Net Mode is Used

The remote I/O net mode is used.

### 9.1.1 Configuring a system

As shown below, a system with three connected remote I/O stations is used as an example.



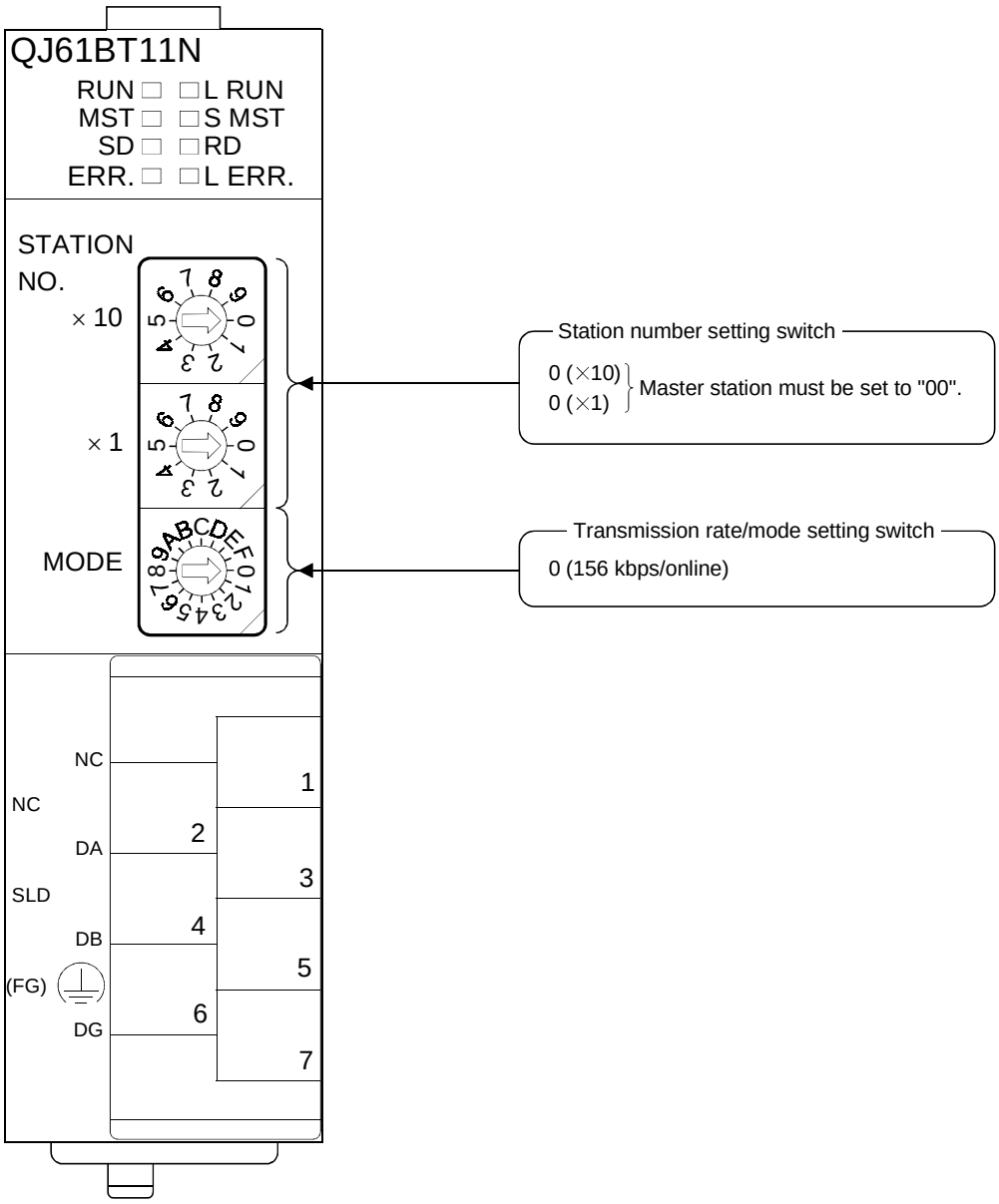




9 - 1

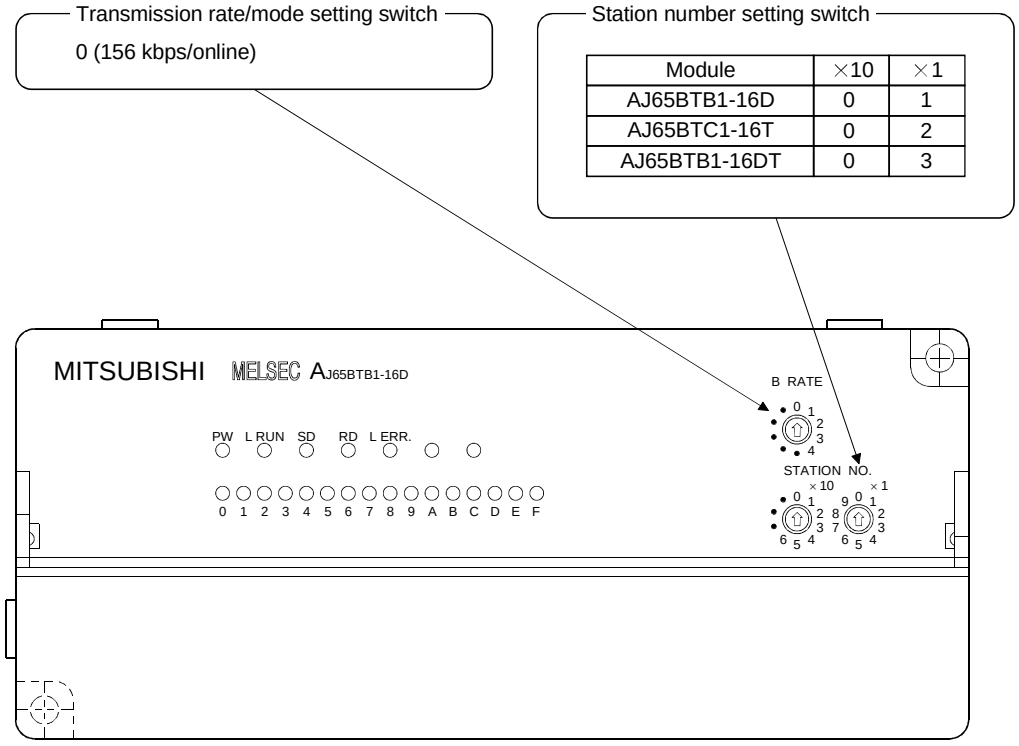
(1) Setting the master station

Settings of the master station switches are shown below:



### (2) Setting the remote I/O stations

Settings of the remote I/O station switches are shown below:


Transmission rate/mode setting switch
0 (156 kbps/online)
Station number setting switch
Module | ×10 | ×1
AJ65BTB1-16D | 0 | 1
AJ65BTC1-16T | 0 | 2
AJ65BTB1-16DT | 0 | 3
MITSUBISHI MELSEC AJ65BTB1-16D
PW L RUN SD RD L ERR.
0 1 2 3 4 5 6 7 8 9 A B C D E F
B RATE
STATION NO.
×10
×1



9 - 3

## 9.1.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

### (1) Setting the network parameters of the master station

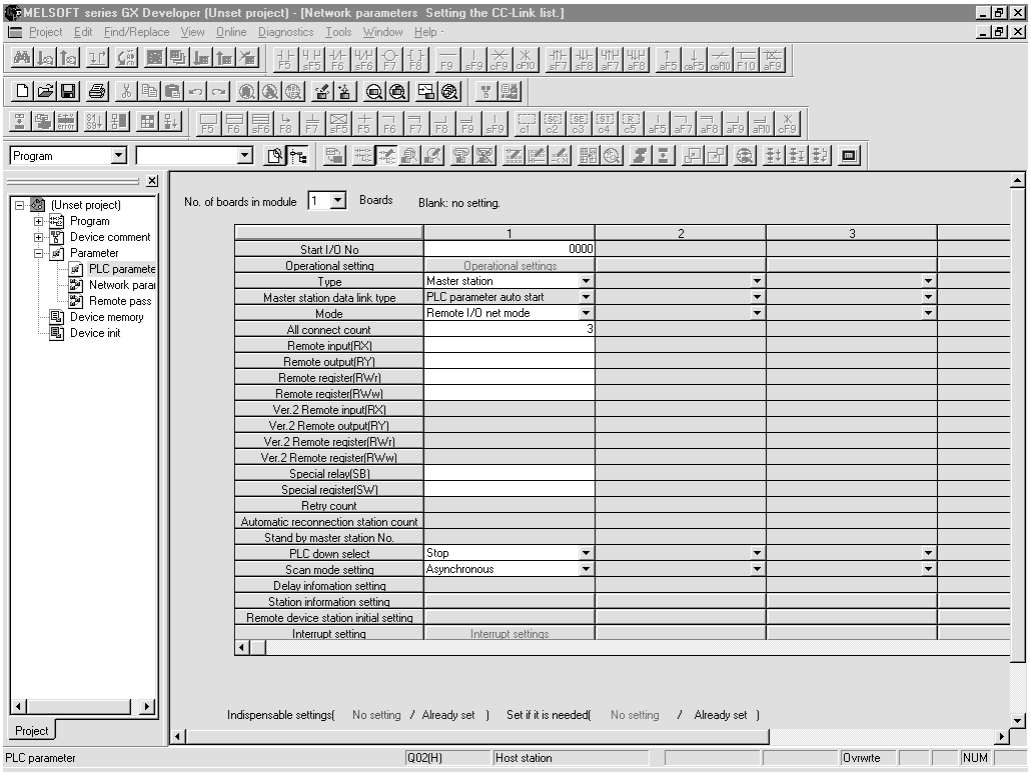
Set the network parameters as follows using the attached parameter setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | (Mater station)<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>(Remote I/O net mode)<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | 3 modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |

| Item | Setting range | Setting value |
|---|---|---|
| Retry count | 1 to 7<br>Default: 3 | ~~times~~ |
| Automatic reconnection station count | 1 to 10<br>Default: 1 | ~~modules~~ |
| Standby master station No. | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | Stop/continue<br>Default: Stop | (Stop)/continue |
| Scan mode setting | Asynchronous/synchronous<br>Default: Asynchronous | (Asynchronous)/synchronous |
| Delay information setting | Set 0. | |

### (a) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

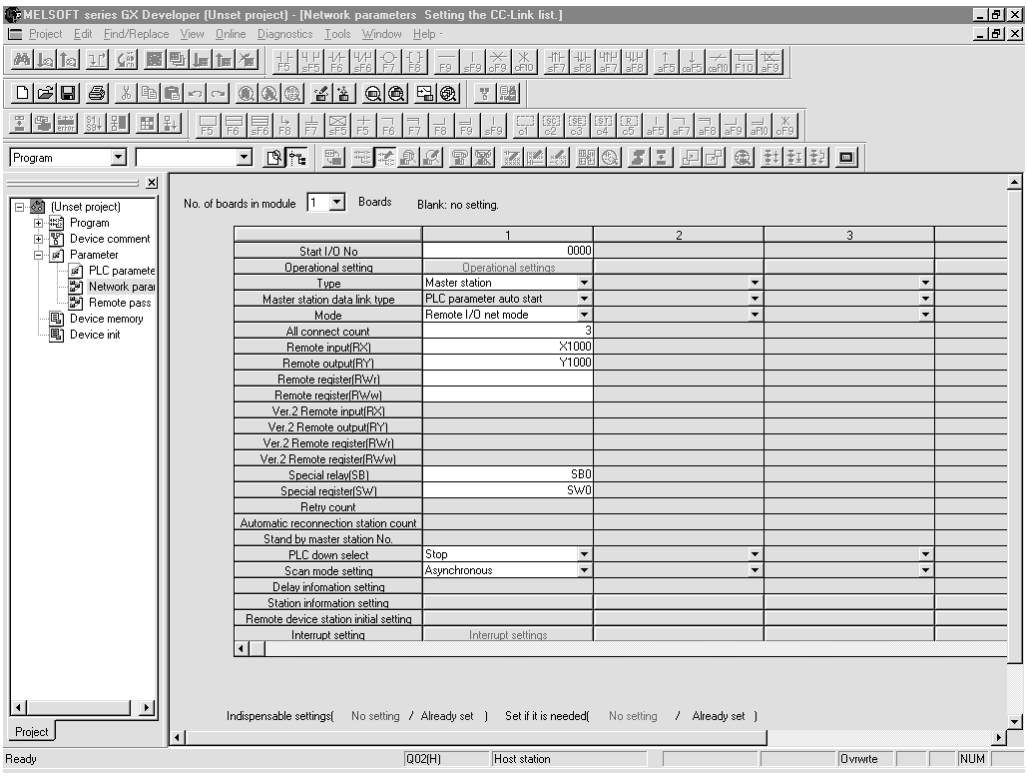
3) Set the refresh device for special relay (SB) to SB0.

4) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting the refresh devices for special relay (SB) and special register (SW) to SB and SW, respectively, make sure that they do not overlap with device numbers used in the MELSECNET/H network. |

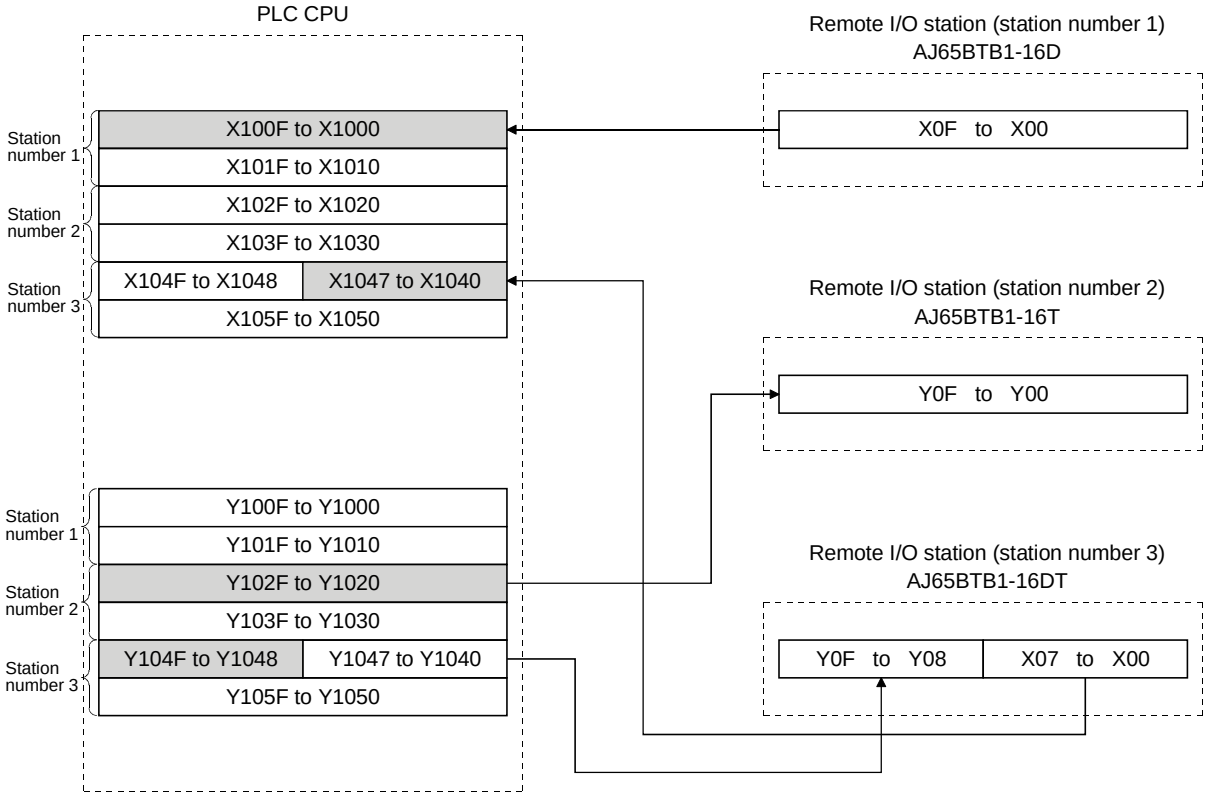
(a) Example of automatic refresh parameter settings

An example of automatic refresh parameter settings is shown below:



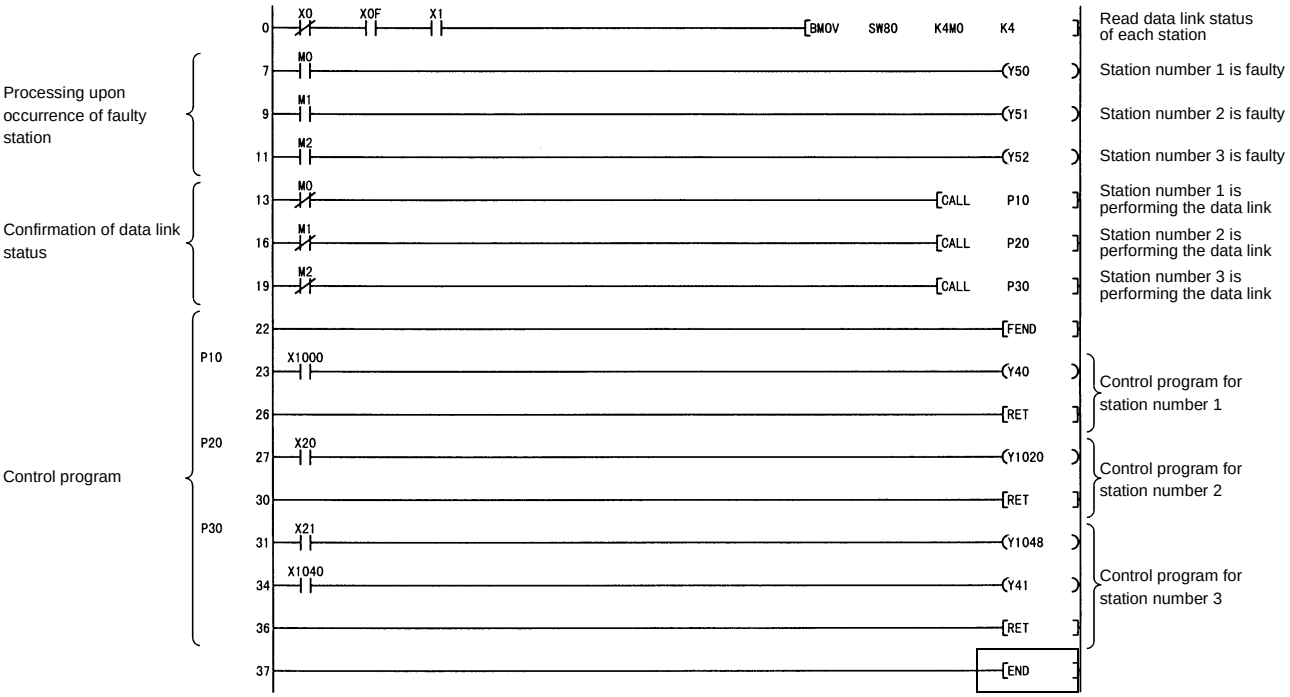
## 9.1.3 Creating a program

This section shows the program used to control the remote I/O stations. The following diagram shows the relationship between the devices of the PLC CPU and the inputs/outputs of remote I/O stations.
The shaded areas indicate the devices that are actually used.





9 - 7


Processing upon occurrence of faulty station
Confirmation of data link status
Control program
P10
P20
P30
0 X0 X0F X1 BMOV SW80 K4M0 K4
Read data link status of each station
7 M0 Y50
Station number 1 is faulty
9 M1 Y51
Station number 2 is faulty
11 M2 Y52
Station number 3 is faulty
13 M0 CALL P10
Station number 1 is performing the data link
16 M1 CALL P20
Station number 2 is performing the data link
19 M2 CALL P30
Station number 3 is performing the data link
22 FEND
23 X1000 Y40
26 RET
Control program for station number 1
27 X20 Y1020
30 RET
Control program for station number 2
31 X21 Y1048
34 X1040 Y41
36 RET
Control program for station number 3
37 END

## 9.1.4 Performing the data link

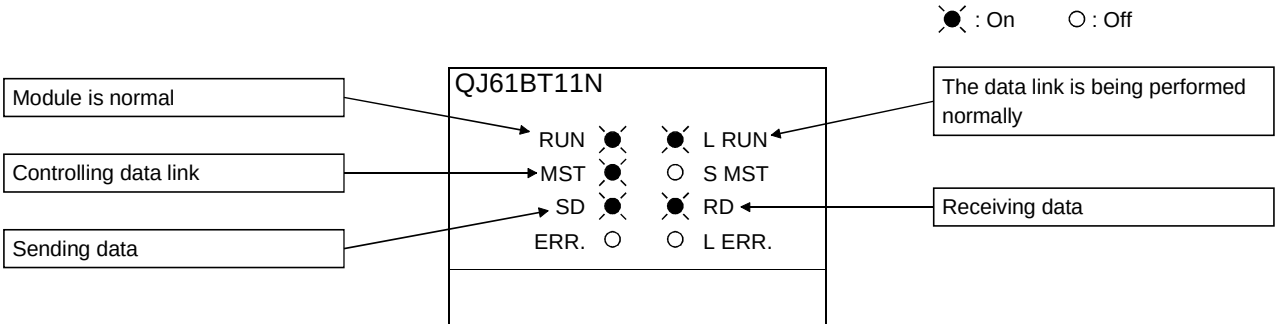
Turn on the power to the remote I/O stations first, and then turn on the power to the master station to start the data link.

### (1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote I/O station when the data link is being performed normally.

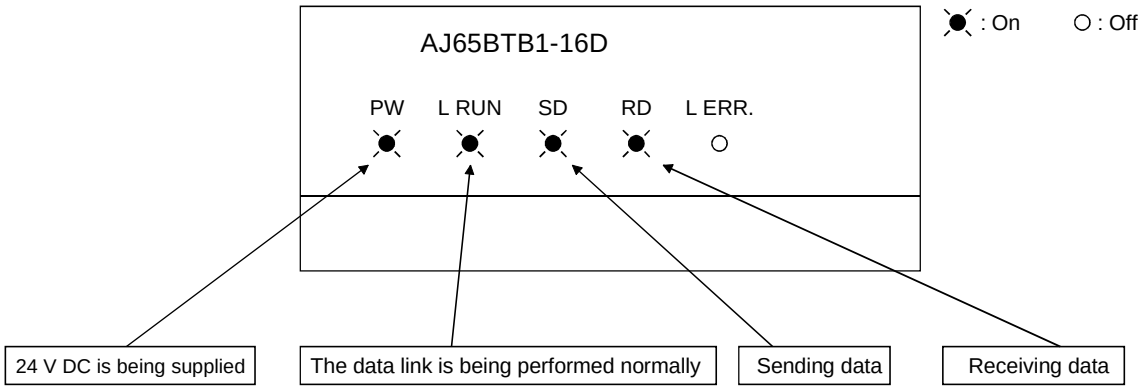
#### (a) LED display of the master station

Make sure that the LED display shows the following status:




#### (b) LED display of the remote I/O station

Make sure that the LED display shows the following status:



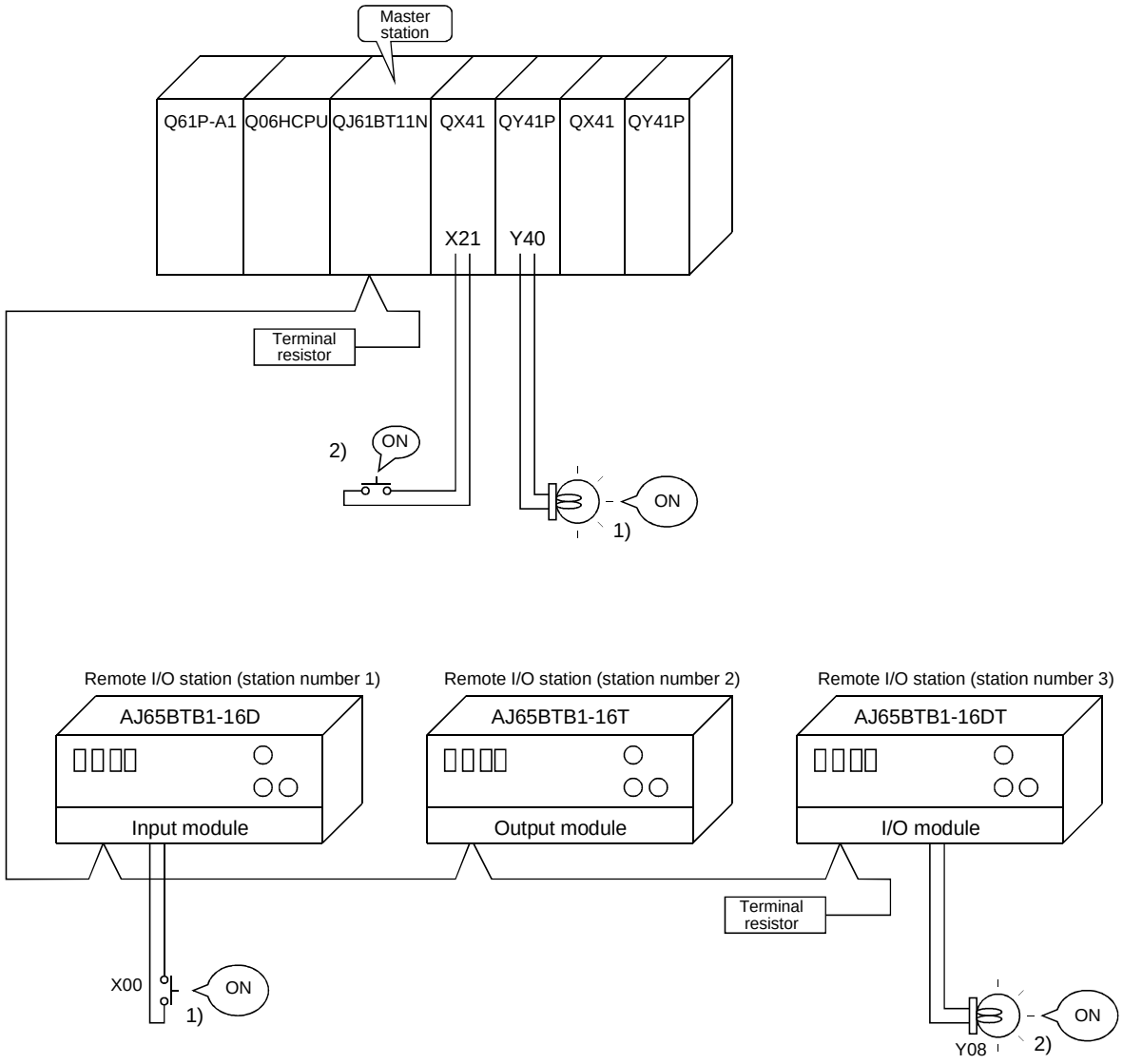



9 - 9

### (2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

1) For example, when X00 of the remote I/O station AJ65BTB1-16D (station number 1) is turned on, Y40 (QY41P) of the master station turns on.
2) When X21 (QX41) of the master station is turned on, Y08 of the remote I/O station AJ65BTB1-16DT (station Number 3) turns on.



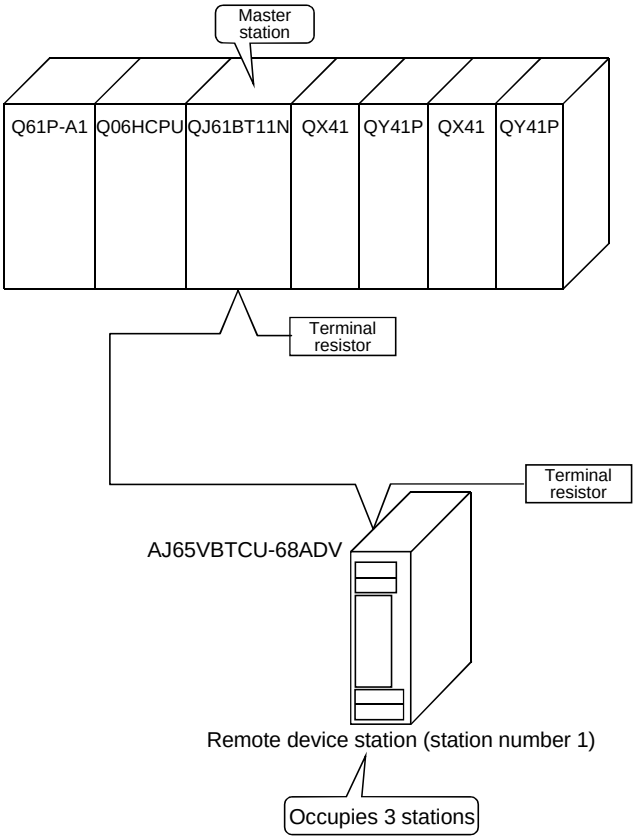
# 10 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE DEVICE STATIONS

This chapter explains the procedures from module settings to parameter settings, programming, and finally operation check using a system configuration example. For more detailed information on remote device stations, see the Remote Device Station User's Manual.

## 10.1 When Remote Net Ver. 1 Mode is Used

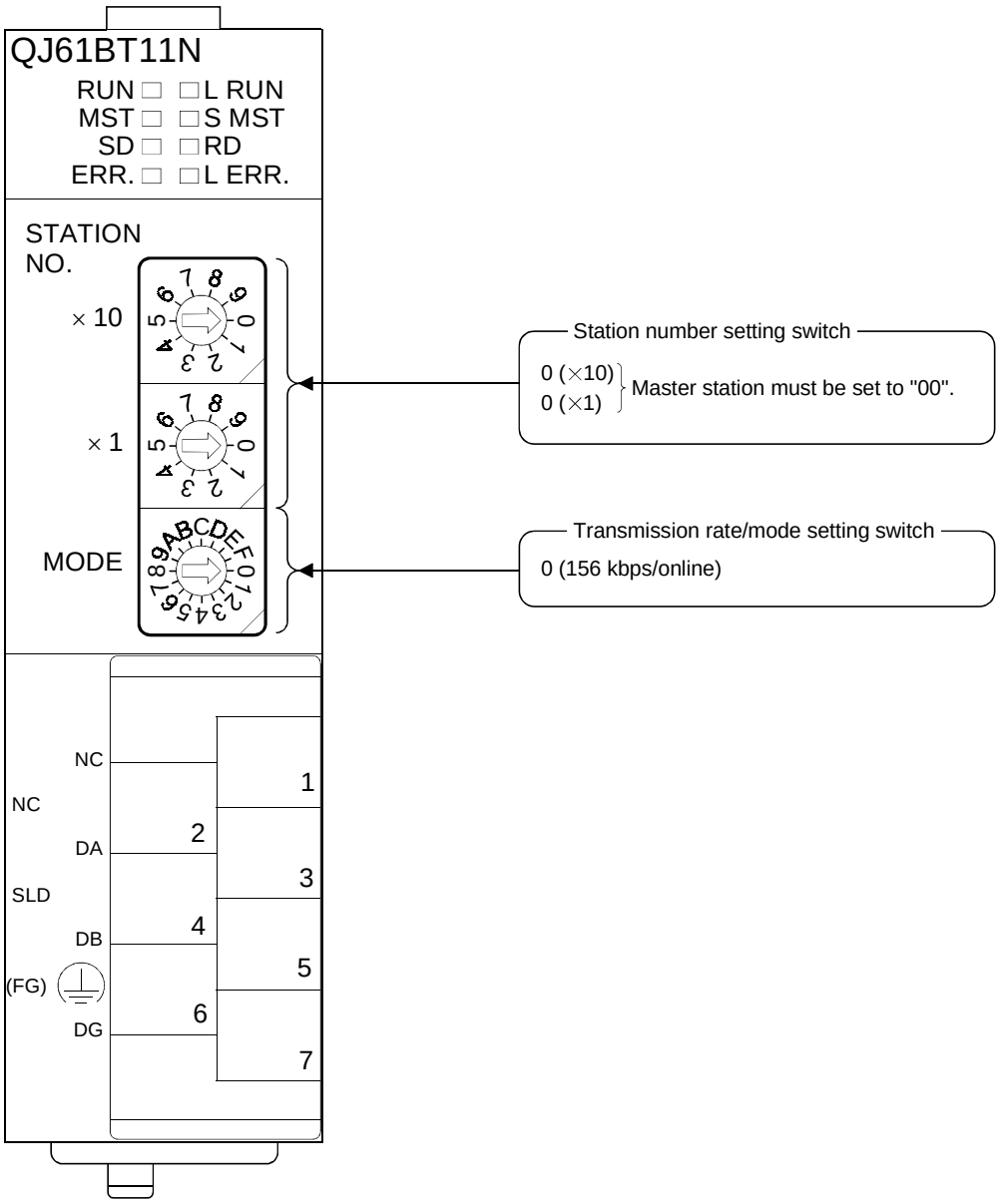
### 10.1.1 Configuring a system

As shown below, a system with one connected remote I/O station is used as an example.



(1) Setting the master station

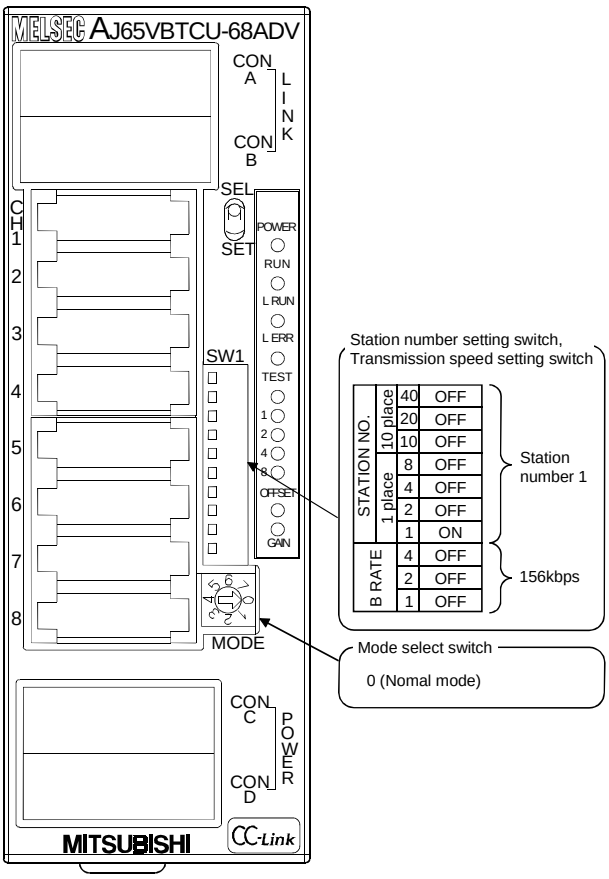
Settings of the master station switches are shown below:



(2) Setting the remote device station

Settings of the remote device station switches are shown below:

For more detailed information about the contents of the settings, see the Remote Device Station User's Manual.



## 10.1.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

### (1) Setting the network parameters of the master station

#### (a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

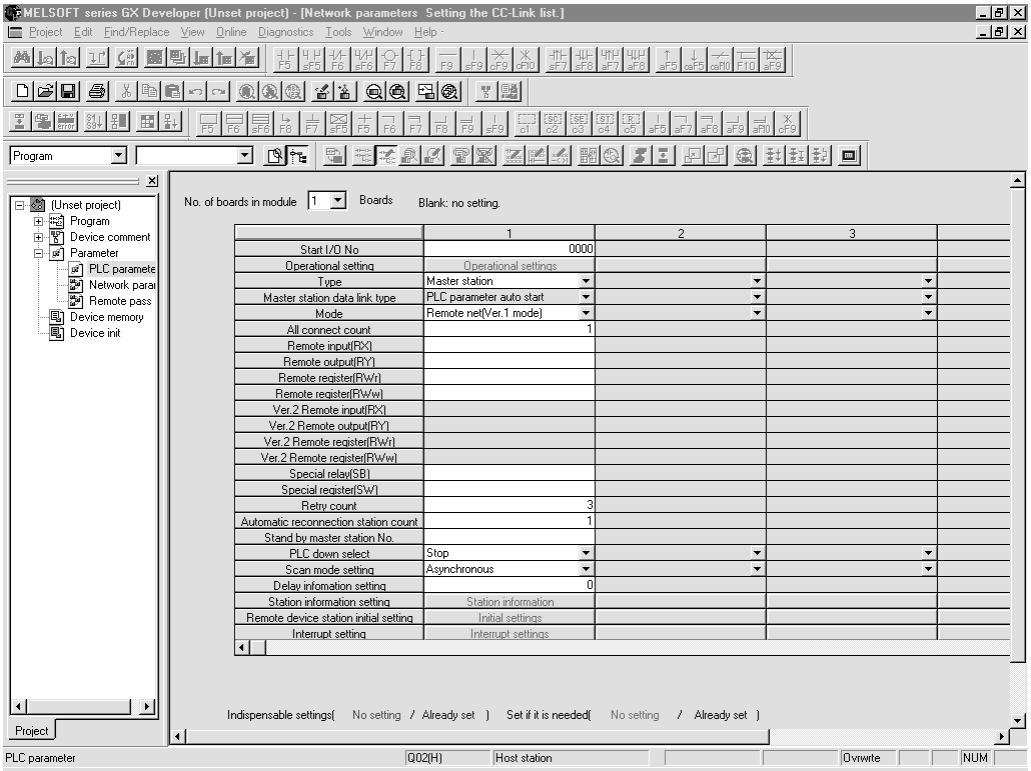
| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | (Mater station)<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | (Remote net (Ver.1 mode))<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | 1 modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |

| Item | Setting range | Setting value |
|---|---|---|
| Retry count | 1 to 7<br>Default: 3 | 3 times |
| Automatic reconnection station count | 1 to 10<br>Default: 1 | 1 modules |
| Standby master station No. | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | Stop/continue<br>Default: Stop | (Stop)/continue |
| Scan mode setting | Asynchronous/synchronous<br>Default: Asynchronous | (Asynchronous)/synchronous |
| Delay information setting | Set 0. | |

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 1 | Remote device station | single | Occupies 3 stations | 96 points | No setting | | | |
| | | | | | | | | |

(b) Example of network parameter settings

An example of network parameter settings is shown below:


MELSOFT series GX Developer (Unset project) - [Network parameters Setting the CC-Link list.]
Project Edit Find/Replace View Online Diagnostics Tools Window Help
Program
(Unset project)
Program
Device comment
Parameter
PLC parameter
Network parameter
Remote password
Device memory
Device init
Project
No. of boards in module 1 Boards Blank: no setting.
Start I/O No 0000
Operational setting Operational settings
Type Master station
Master station data link type PLC parameter auto start
Mode Remote net(Ver.1 mode)
All connect count 1
Retry count 3
Automatic reconnection station count 1
Stand by master station No.
PLC down select Stop
Scan mode setting Asynchronous
Delay infomation setting 0
Station information setting Station information
Remote device station initial setting Initial settings
Interrupt setting Interrupt settings
Indispensable settings( No setting / Already set ) Set if it is needed( No setting / Already set )
PLC parameter
Q02(H)
Host station
Ovrwrte
NUM

(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W100.

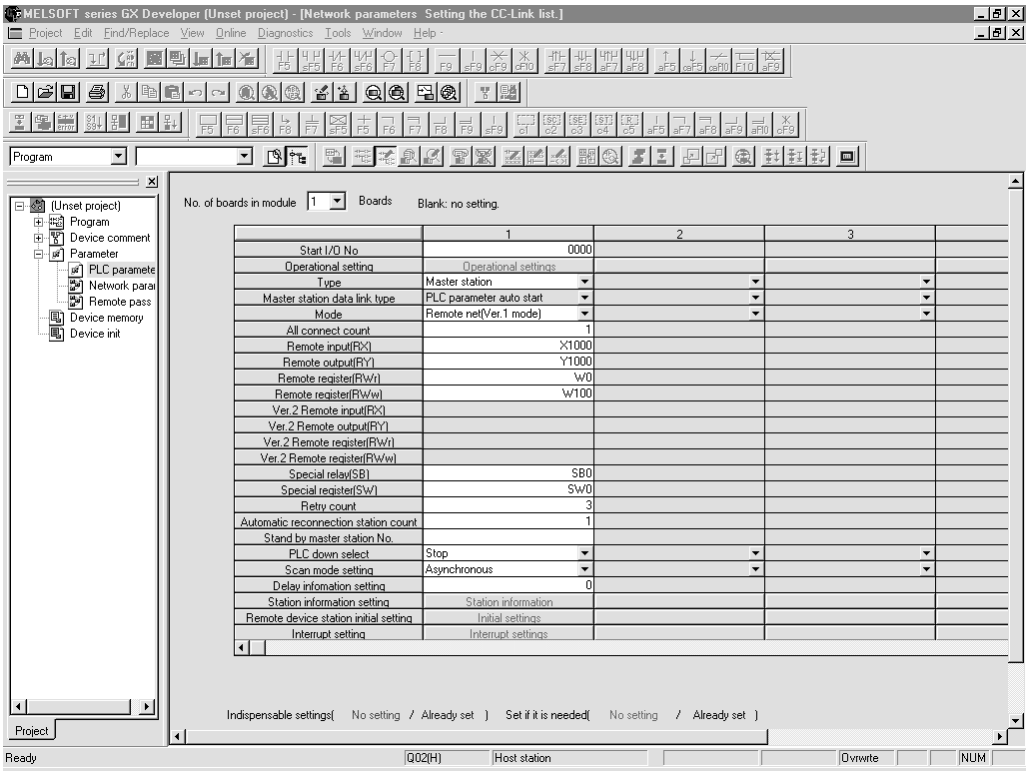
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

A setting example is shown below.



## 10.1.3 Initial setting of the remote device station

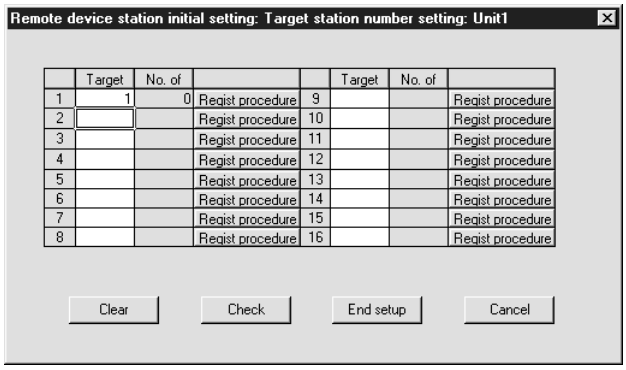
This section explains the initial setting of the remote device station.

### (1) Setting the target station number

Set the target station for which the initial setting is performed.

#### (a) Setting the target station number

Set the target to "1".




#### (b) Selecting the Regist procedure

Click the "Regist procedure" of the target station number "1".

### (2) Setting the regist procedure registration

Set the conditions and details of the remote device station settings.
In this section, AJ65VBTCU-68ADV is used as an example for the Regist procedure registration.
The details to be set are as follows:

- Set channels 1, 2 to A-D conversion enable (the first condition).
- Set the Input range of channel 1 to 0 - 5V, and channel 2 to User range setting 1 (the second condition).
- Set channel 1 to Sampling processing, and specify channel 2 as Average processing and set it to Number of times (the third condition).
- Set channel 2 Average number of times to 16 times (the forth condition).
- Turn the Initial data processing completed flag to ON (the fifth condition).
- Turn the Initial data setting request flag to ON (the sixth condition).
- Turn the Initial data processing completed flag to OFF (the seventh condition).
- Turn the Initial data setting request flag to OFF (the eighth condition).

For more detailed information about the settings, see the Remote Device Station User's Manual.

Set the input format to "HEX.".

#### (a) Setting the first condition

##### 1) Execute Flag setting

Set the "Execute Flag" to "Execute".

##### 2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "ON".

4) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "00", and the "Write Data" to "0003".

(b) Setting the second condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "01", and "Write Data" to "0031".

(c) Setting the third condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw" ,the "Device Number" to "03", and the "Write Data" to "0200".

(d) Setting the fourth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "05", and the "Write Data" to "0010".

(e) Setting the fifth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "ON".

(f) Setting the sixth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set "Write Device" to "RY", the "Device Number" to "19", and the "Write Data" to "ON".

(g) Setting the seventh condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "OFF".

4) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "OFF".

(h) Setting the eighth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "19", and the "Execute Condition" to "ON".

4) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "19", and the "Write Data" to "OFF".

(i) Setting results

The results of settings (a) to (h) are shown below.

**Remote device station initial setting: Procedure registration module 1: Target station 1**

Input format: HEX.

| Execute Flag | Operational condition | Executional condition | | | Details of execution | | |
|---|---|---|---|---|---|---|---|
| | | Condition Device | Device Number | Execute Condition | Write Device | Device Number | Write Data |
| Execute | Set new | RX | 18 | ON | RWw | 00 | 0003 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 01 | 0031 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 03 | 0200 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 05 | 0010 |
| Execute | Same as prev.set | RX | 18 | ON | RY | 18 | ON |
| Execute | Same as prev.set | RX | 18 | ON | RY | 19 | ON |
| Execute | Set new | RX | 18 | OFF | RY | 18 | OFF |
| Execute | Set new | RX | 19 | ON | RY | 19 | OFF |



10 - 10

### (3) Validating the remote device station initial settings

This section explains the link special relays (SB) relating to the initial settings of remote device stations.

Numeric values in parentheses in the Number column indicate addresses and bit positions of the buffer memory.

Example: For buffer memory address 5E0H and bit 13: (5E0H, b13)

Table 10.1 List of link special relays related to remote device station initial settings

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB000D (5E0H, b13) | Remote device station initialization procedure registration instruction | Starts initial processing using the information registered during the initialization procedure registration.<br>While SB000D is on, the refresh of the remote input/output and remote registers stops.<br>OFF: No instruction<br>ON: Instructed | ○ * | × | × |
| SB005E (5E5H, b14) | Execution status of remote device station initialization procedure | Indicates the execution status of the initialization procedure.<br>OFF: Not executed<br>ON: Being executed | ○ * | × | × |
| SB005F (5E0H, b15) | Complete status of remote device station initialization procedure | Indicates completion status of the execution of the initialization procedure execution.<br>OFF: Not complete<br>ON: Complete | ○ * | × | × |
| SW005F (65FH) | Remote device station initialization procedure instruction result | Stores the execution result of initialization procedure registration instruction with SB000B.<br>0: Normal<br>Other than 0: Store the error code (see Section 13.3). | ○ * | × | × |

* Cannot be used for the standby master station that is controlling the data link.

For details on how to create a program, see Section 10.1.4.

**POINT**

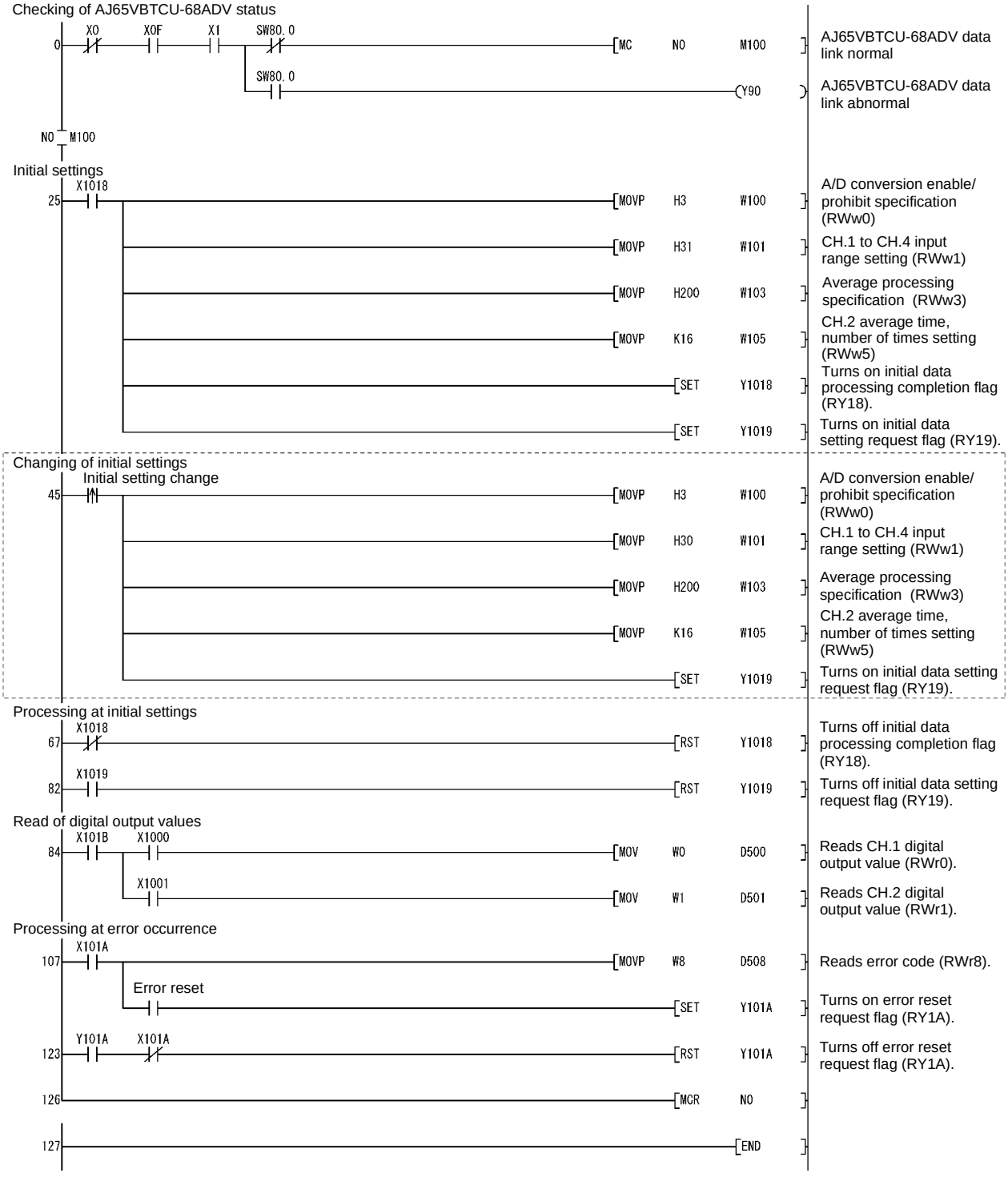
(1) When remote device station initialization procedure registration instruction (SB0000) is turned off after the initial processing completion, all of the RY signals that has been turned on in the initial procedure registration is turned off. Therefore, about signals that are required to turn always on, such as conversion valid signal, they should be turned on in the sequence program.

(2) If the procedure registration is not completed for all stations registered to the remote device station initialization procedure registration, the completion status of remote device station initialization procedure (SB005F) does not turn on. If there is a faulty station, turn off the remote device station initialization procedure registration instruction (SB000D) according to the completion status of the other stations.

REMARK

Setting with the sequence program (Reference)

For reference, an example setting performed with the sequence program is shown below.




The program enclosed by the dotted line is necessary only when the initial settings are changed.

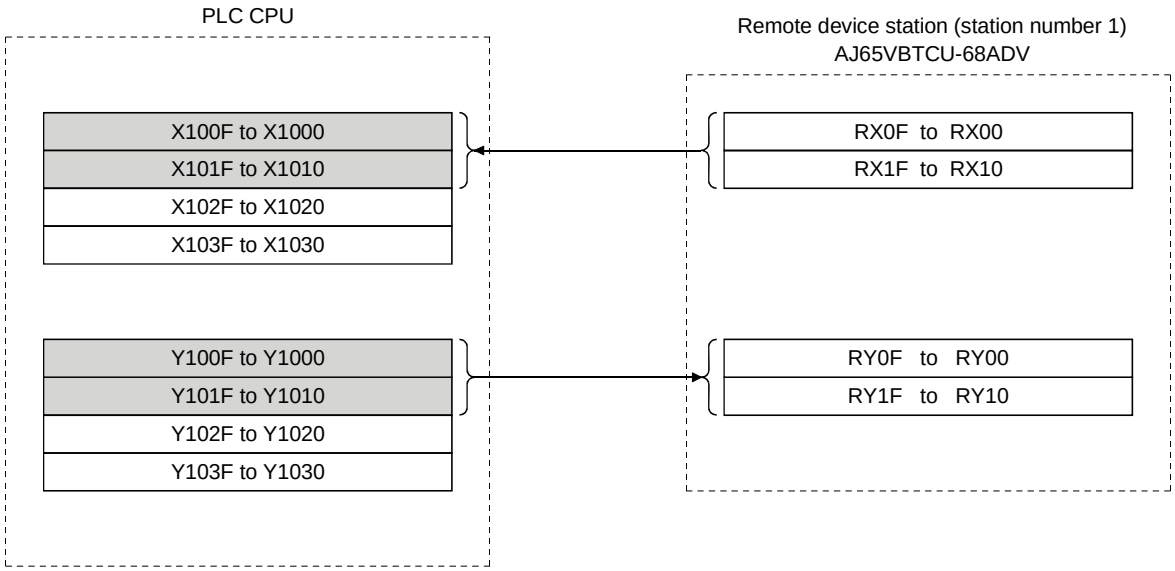


10 - 12

## 10.1.4 Creating a program

This section shows a program used to control remote device stations.
The following diagrams show the relationships of the remote input/output and remote registers between the PLC CPU devices and the remote device station.
The shaded areas indicate the devices that are actually used.
For detailed information about each remote device station, see the User's Manual for each module.

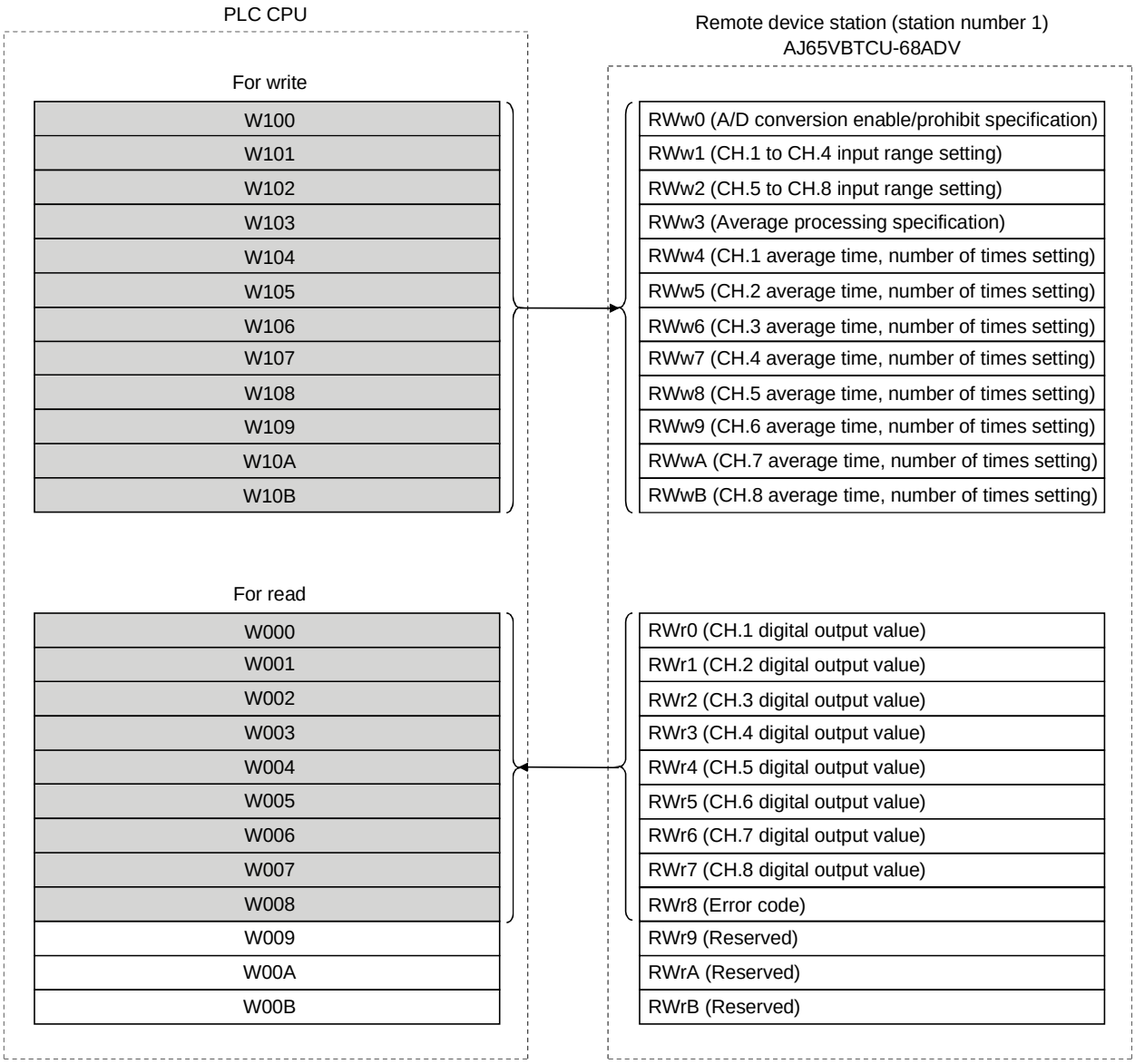
[Remote input (RX) and remote output (RY)]





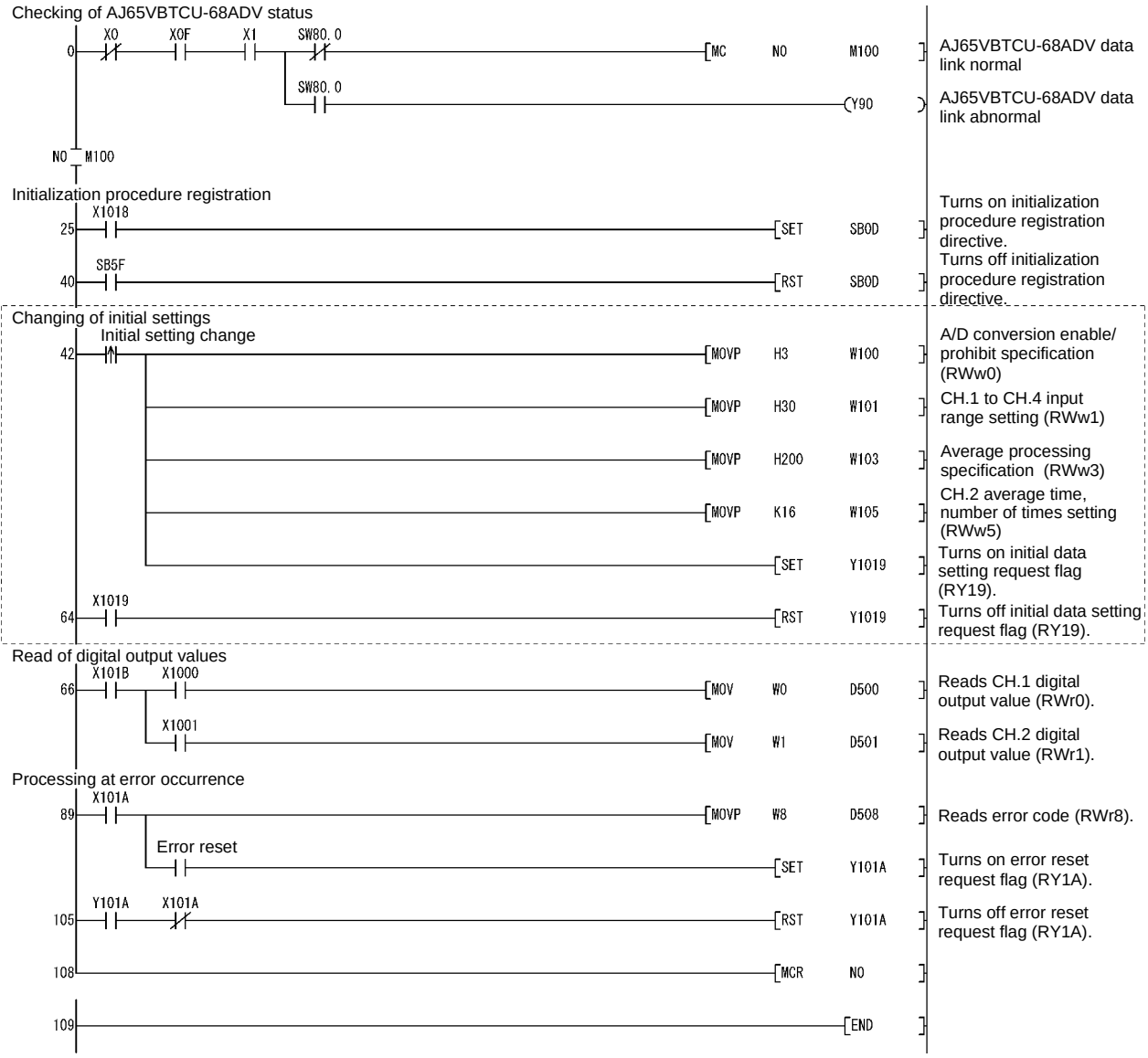
10 - 13

[Remote registers (RWw and RWr)]





10 - 14




The program enclosed by the dotted line is necessary only when the initial settings are changed.


10 - 15

## 10.1.5 Performing the data link

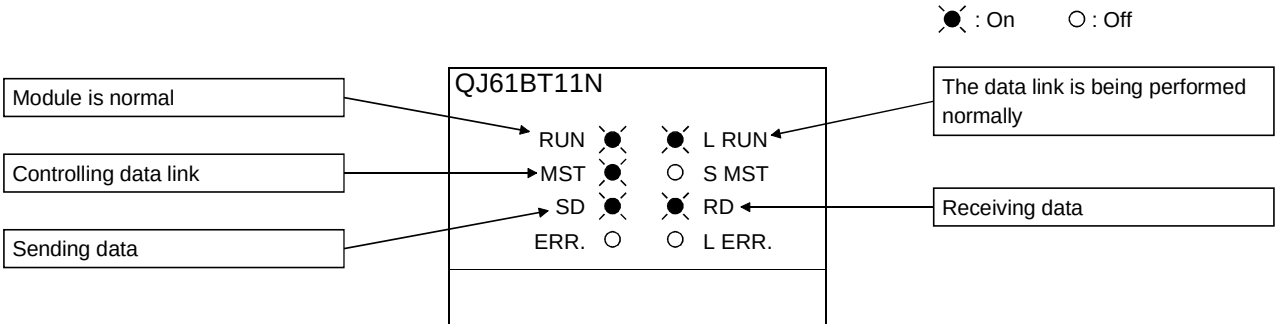
Turn on the power to the remote device station first, and then turn on the power to the master station to start the data link.

### (1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote device station when the data link is being performed normally.

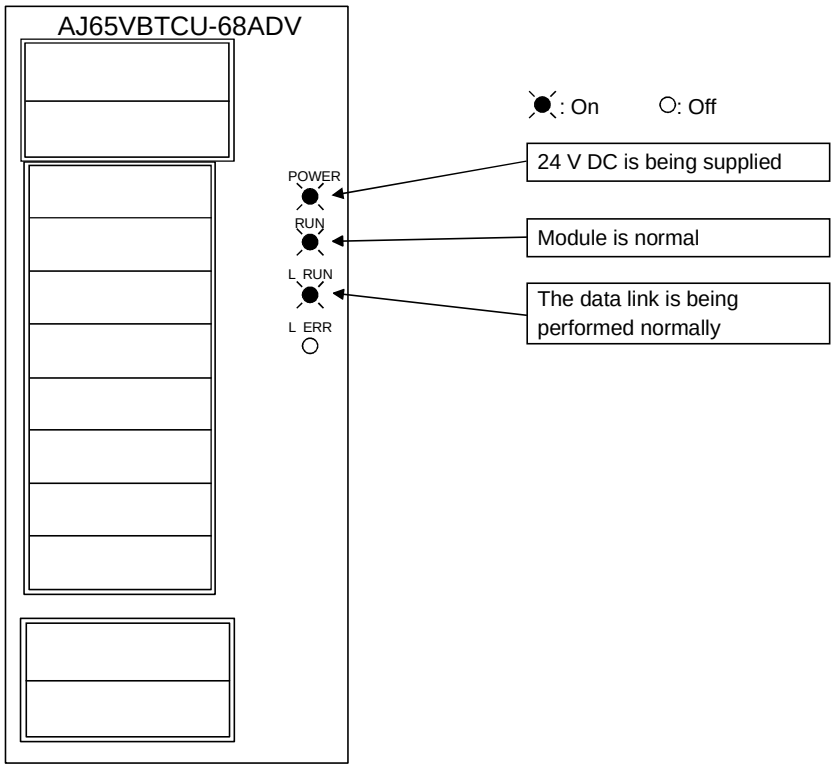
#### (a) LED display of the master station

Make sure that the LED display shows the following status:




#### (b) LED display of the remote device station

Make sure that the LED display shows the following status:



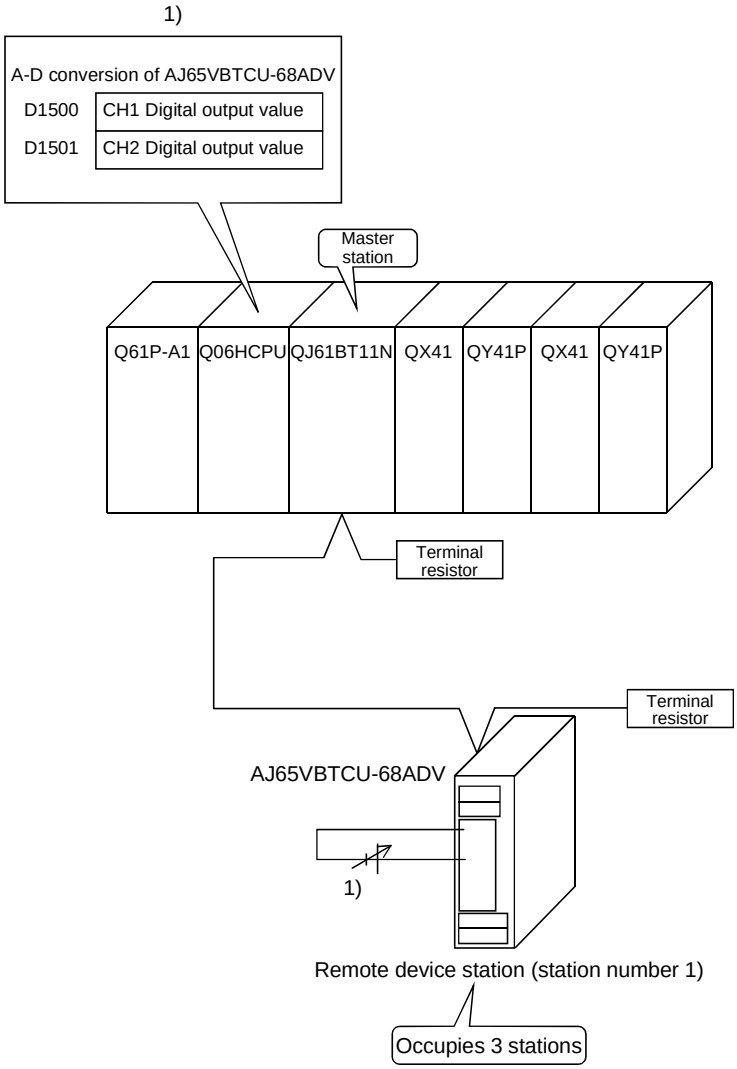


10 - 16

## (2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

1) Change the voltage input to the AJ65VBTCU-68ADV and confirm that the A-D converted digital value also changes.



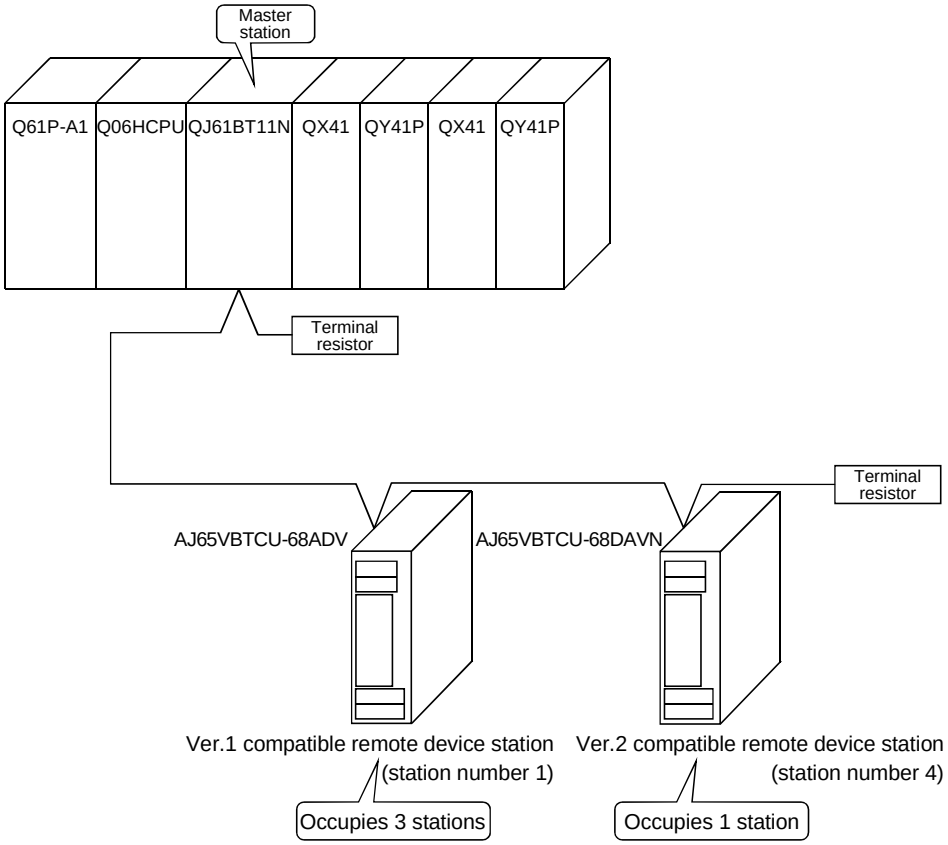


10 - 17

## 10.2 When Remote Net Ver.2 Mode is Used

### 10.2.1 Configuring a system

As shown below, a system where one ver.1 compatible remote device station and one ver.2 compatible remote device station are connected is used as an example.

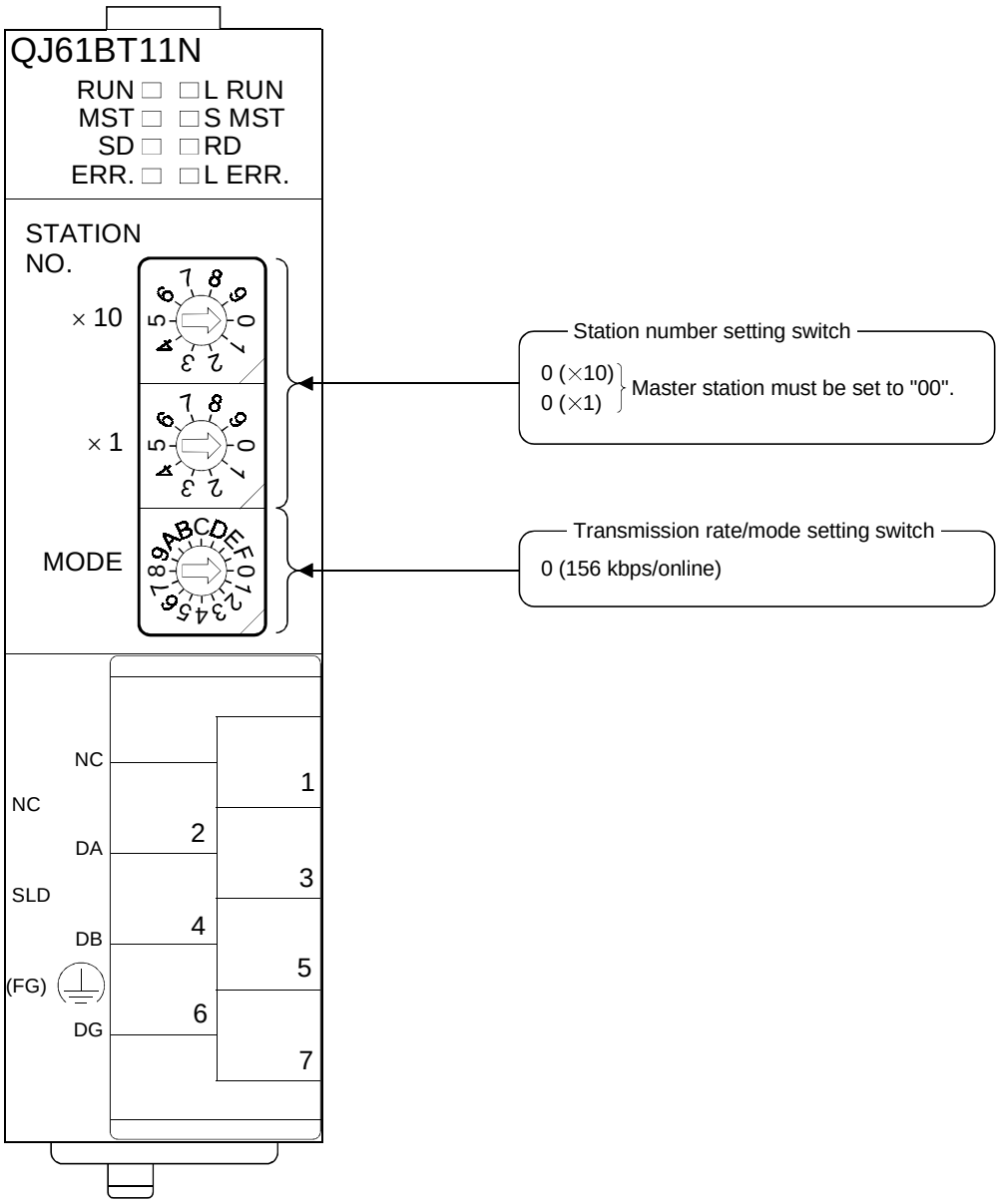




10 - 18

(1) Setting the master station

Settings of the master station switches are shown below:





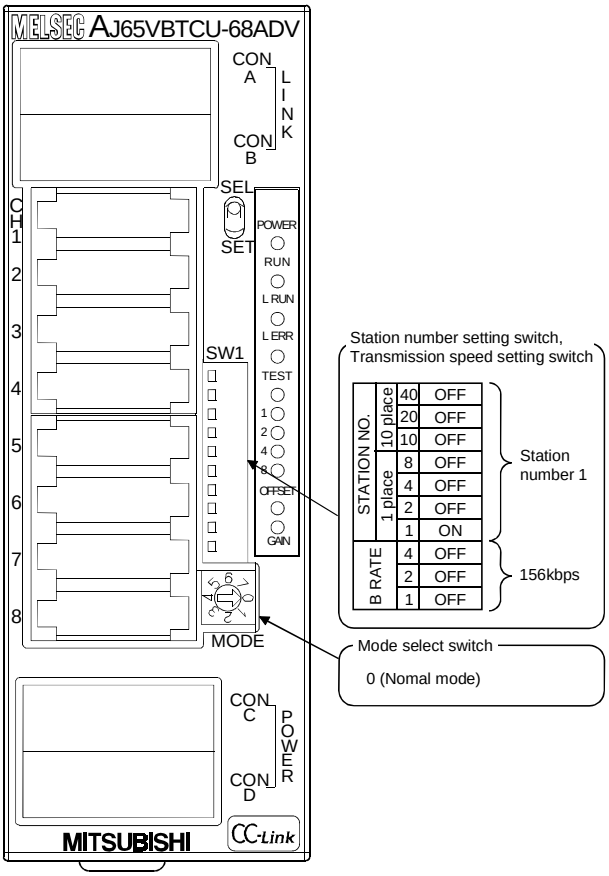

10 - 19

## (2) Setting the remote device station

Settings of the remote device station switches are shown below:

For more detailed information about the contents of the settings, see the Remote Device Station User's Manual.

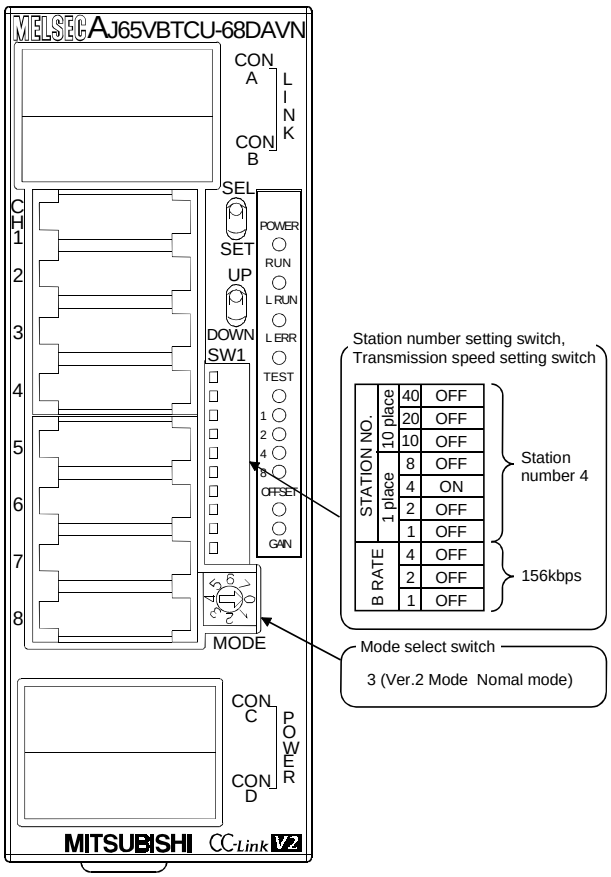
Setting of AJ65VBTCU-68ADV






10 - 20

Setting of AJ65VBTCU-68DAVN






10 - 21

## 10.2.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

### (1) Setting the network parameters of the master station

#### (a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

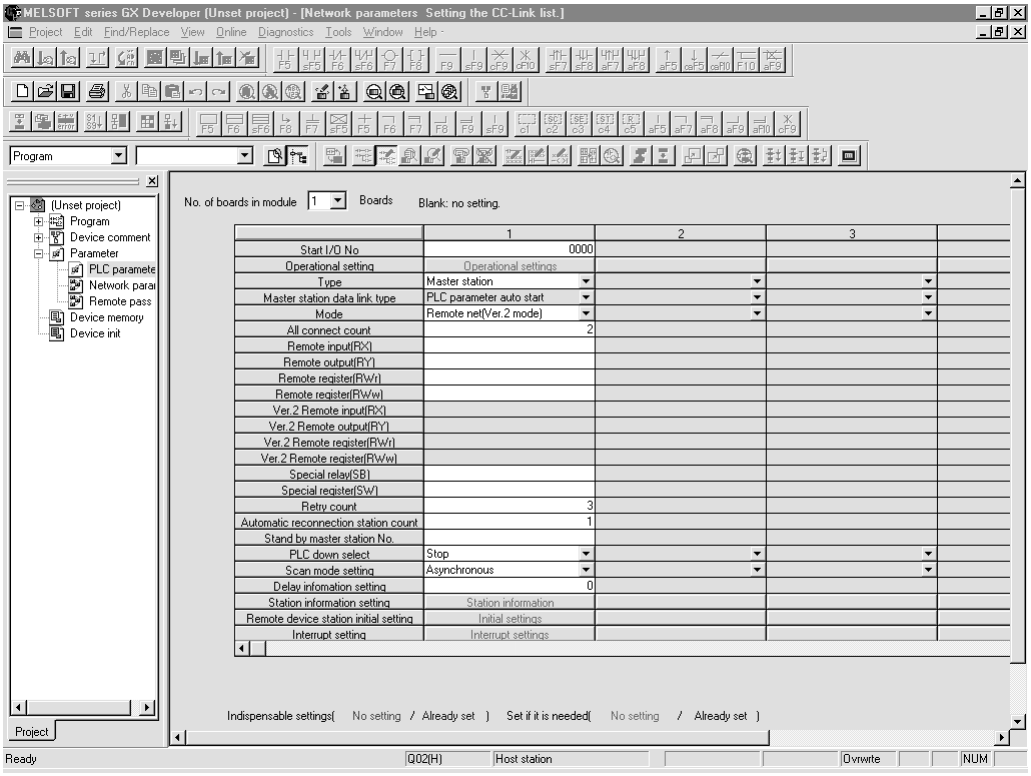
| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | (Mater station)<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>(Remote net (Ver.2 mode))<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | 2 modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |

| Item | Setting range | Setting value |
|---|---|---|
| Retry count | 1 to 7<br>Default: 3 | 3 times |
| Automatic reconnection station count | 1 to 10<br>Default: 1 | 1 modules |
| Standby master station No. | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | Stop/continue<br>Default: Stop | (Stop)/continue |
| Scan mode setting | Asynchronous/synchronous<br>Default: Asynchronous | (Asynchronous)/synchronous |
| Delay information setting | Set 0. | |

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 1 | Ver.1Remote device station | single | Occupies 3 stations | 96 points | No setting | | | |
| | | | | | | | | |
| 4 | Ver.2Remote device station | quadruple | Occupies 1 station | 64 points | No setting | | | |
| | | | | | | | | |

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W1000.

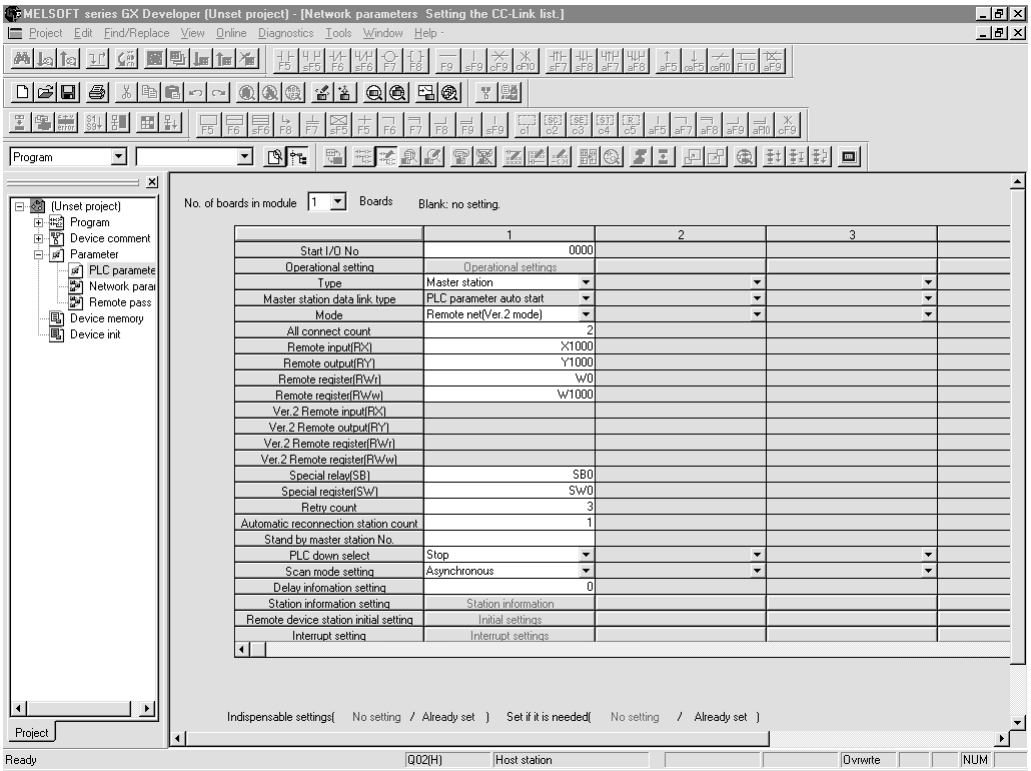
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

A setting example is shown below.



## 10.2.3 Initial setting of the remote device station

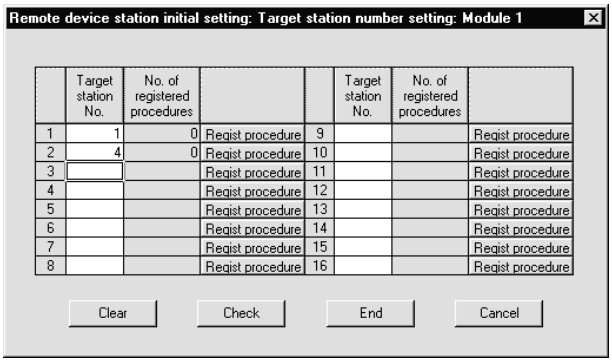
This section explains the initial setting of the remote device station.

### (1) Setting the target station number

Set the target station for which the initial setting is performed.

#### (a) Setting the target station number

Set the target station numbers to "1" and "4".




#### (b) Selecting the Regist procedure

Click the "Regist procedure" of the target station number "1".

### (2) Setting the regist procedure registration

Set the conditions and details of the remote device station settings.
In this section, AJ65VBTCU-68ADV is used as an example for the Regist procedure registration.
The details to be set are as follows:

- Set channels 1, 2 to A-D conversion enable (the first condition).
- Set the Input range of channel 1 to 0 - 5V, and channel 2 to User range setting 1 (the second condition).
- Set channel 1 to Sampling processing, and specify channel 2 as Average processing and set it to Number of times (the third condition).
- Set channel 2 Average number of times to 16 times (the forth condition).
- Turn the Initial data processing completed flag to ON (the fifth condition).
- Turn the Initial data setting request flag to ON (the sixth condition).
- Turn the Initial data processing completed flag to OFF (the seventh condition).
- Turn the Initial data setting request flag to OFF (the eighth condition).

For more detailed information about the settings, see the Remote Device Station User's Manual.

Set the input format to "HEX.".

#### (a) Setting the first condition

##### 1) Execute Flag setting

Set the "Execute Flag" to "Execute".

##### 2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "ON".

4) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "00", and the "Write Data" to "0003".

(b) Setting the second condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "01", and "Write Data" to "0031".

(c) Setting the third condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw" ,the "Device Number" to "03", and the "Write Data" to "0200".

(d) Setting the fourth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "05", and the "Write Data" to "0010".

(e) Setting the fifth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "ON".

(f) Setting the sixth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set "Write Device" to "RY", the "Device Number" to "19", and the "Write Data" to "ON".

(g) Setting the seventh condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "OFF".

4) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "OFF".

(h) Setting the eighth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "19", and the "Execute Condition" to "ON".

4) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "19", and the "Write Data" to "OFF".

(i) Setting results

The results of settings (a) to (h) are shown below.

**Remote device station initial setting: Procedure registration module 1: Target station 1**

Input format: HEX.

| Execute Flag | Operational condition | Executional condition: Condition Device | Executional condition: Device Number | Executional condition: Execute Condition | Details of execution: Write Device | Details of execution: Device Number | Details of execution: Write Data |
|---|---|---|---|---|---|---|---|
| Execute | Set new | RX | 18 | ON | RWw | 00 | 0003 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 01 | 0031 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 03 | 0200 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 05 | 0010 |
| Execute | Same as prev.set | RX | 18 | ON | RY | 18 | ON |
| Execute | Same as prev.set | RX | 18 | ON | RY | 19 | ON |
| Execute | Set new | RX | 18 | OFF | RY | 18 | OFF |
| Execute | Set new | RX | 19 | ON | RY | 19 | OFF |

Similarly, make the procedure registration of the AJ65VBTCU-68DAVN. Click the "Regist procedure" of the target station number "4".

The details to be set are as follows:

- Set channels 1, 2 to Analog output enable. (the first condition)
- Set the output range of channel 1 to 0 - 5V, and channel 2 to User range setting 1. (the second condition)
- Set the HOLD/CLEAR setting of channels 1, 2 to CLEAR. (the third condition)
- Turn the Initial data processing completed flag to ON (the forth condition).
- Turn the Initial data setting request flag to ON (the fifth condition).
- Turn the Initial data processing completed flag to OFF (the sixth condition).
- Turn the Initial data setting request flag to OFF (the seventh condition).

**Remote device station initial setting: Procedure registration module 1: Target station 4**

Input format: HEX.

| Execute Flag | Operational condition | Executional condition: Condition Device | Executional condition: Device Number | Executional condition: Execute Condition | Details of execution: Write Device | Details of execution: Device Number | Details of execution: Write Data |
|---|---|---|---|---|---|---|---|
| Execute | Set new | RX | 18 | ON | RWw | 08 | 00FC |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 09 | 0031 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 0B | 0000 |
| Execute | Same as prev.set | RX | 18 | ON | RY | 18 | ON |
| Execute | Same as prev.set | RX | 18 | ON | RY | 19 | ON |
| Execute | Set new | RX | 18 | OFF | RY | 18 | OFF |
| Execute | Set new | RX | 19 | ON | RY | 19 | OFF |

### (3) Validating the remote device station initial settings

This section explains the link special relays (SB) relating to the initial settings of remote device stations.
Numeric values in parentheses in the Number column indicate addresses and bit positions of the buffer memory.

Example: For buffer memory address 5E0H and bit 13: (5E0H, b13)

Table 10.2 List of link special relays related to remote device station initial settings

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB000D (5E0H, b13) | Remote device station initialization procedure registration instruction | Starts initial processing using the information registered during the initialization procedure registration.<br>While SB000D is on, the refresh of the remote input/output and remote registers stops.<br>OFF: No instruction<br>ON: Instructed | ○ * | × | × |
| SB005E (5E5H, b14) | Execution status of remote device station initialization procedure | Indicates the execution status of the initialization procedure.<br>OFF: Not executed<br>ON: Being executed | ○ * | × | × |
| SB005F (5E0H, b15) | Complete status of remote device station initialization procedure | Indicates completion status of the execution of the initialization procedure execution.<br>OFF: Not complete<br>ON: Complete | ○ * | × | × |
| SW005F (65FH) | Remote device station initialization procedure instruction result | Stores the execution result of initialization procedure registration instruction with SB000B.<br>0: Normal<br>Other than 0: Store the error code (see Section 13.3). | ○ * | × | × |

* Cannot be used for the standby master station that is controlling the data link.

For details on how to create a program, see Section 10.2.4.

**POINT**

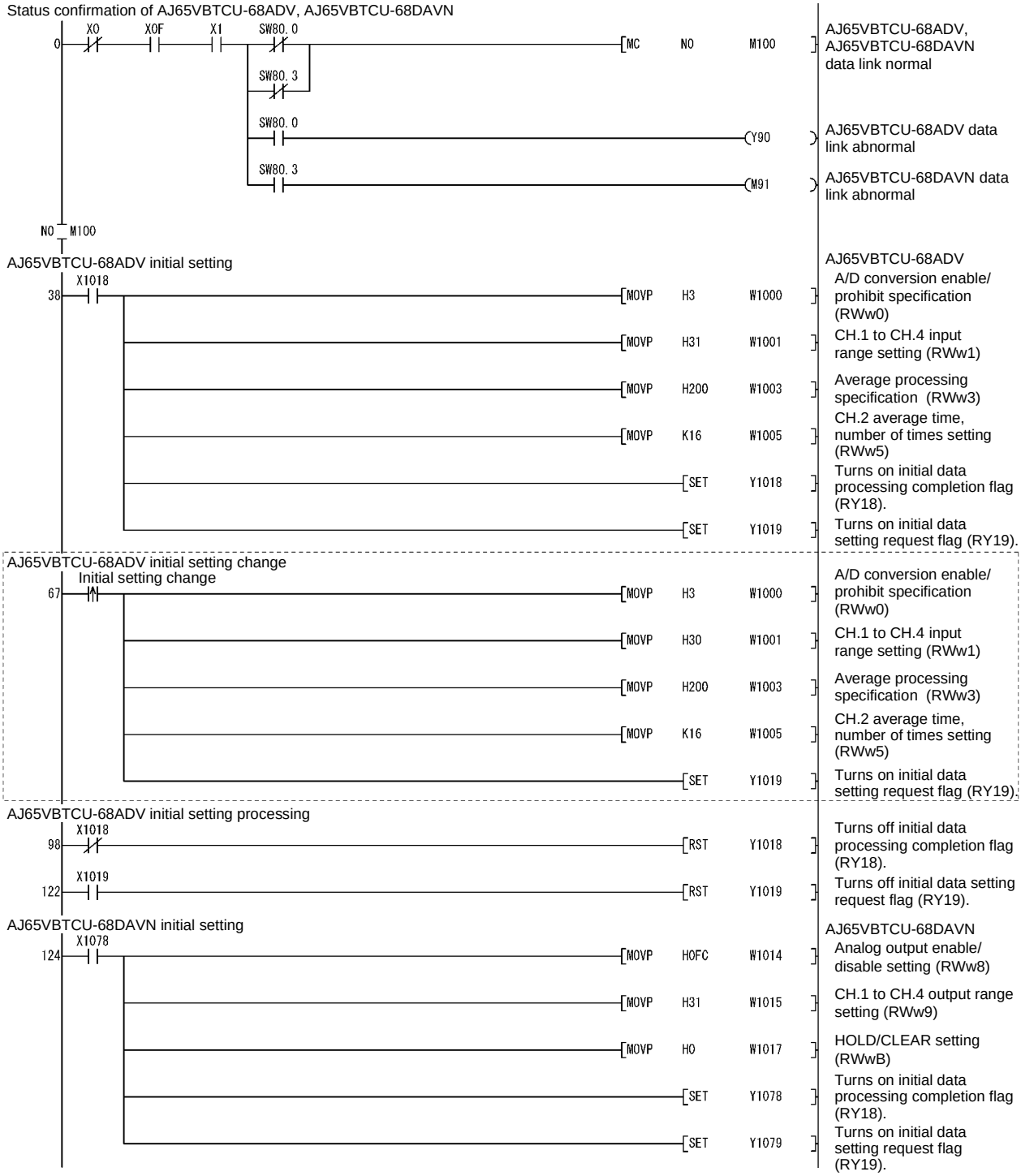
(1) When remote device station initialization procedure registration instruction (SB0000) is turned off after the initial processing completion, all of the RY signals that has been turned on in the initial procedure registration is turned off. Therefore, about signals that are required to turn always on, such as conversion valid signal, they should be turned on in the sequence program.

(2) If the procedure registration is not completed for all stations registered to the remote device station initialization procedure registration, the completion status of remote device station initialization procedure (SB005F) does not turn on.
If there is a faulty station, turn off the remote device station initialization procedure registration instruction (SB000D) according to the completion status of the other stations.

REMARK

Setting with the sequence program (Reference)

For reference, an example setting performed with the sequence program is shown below.

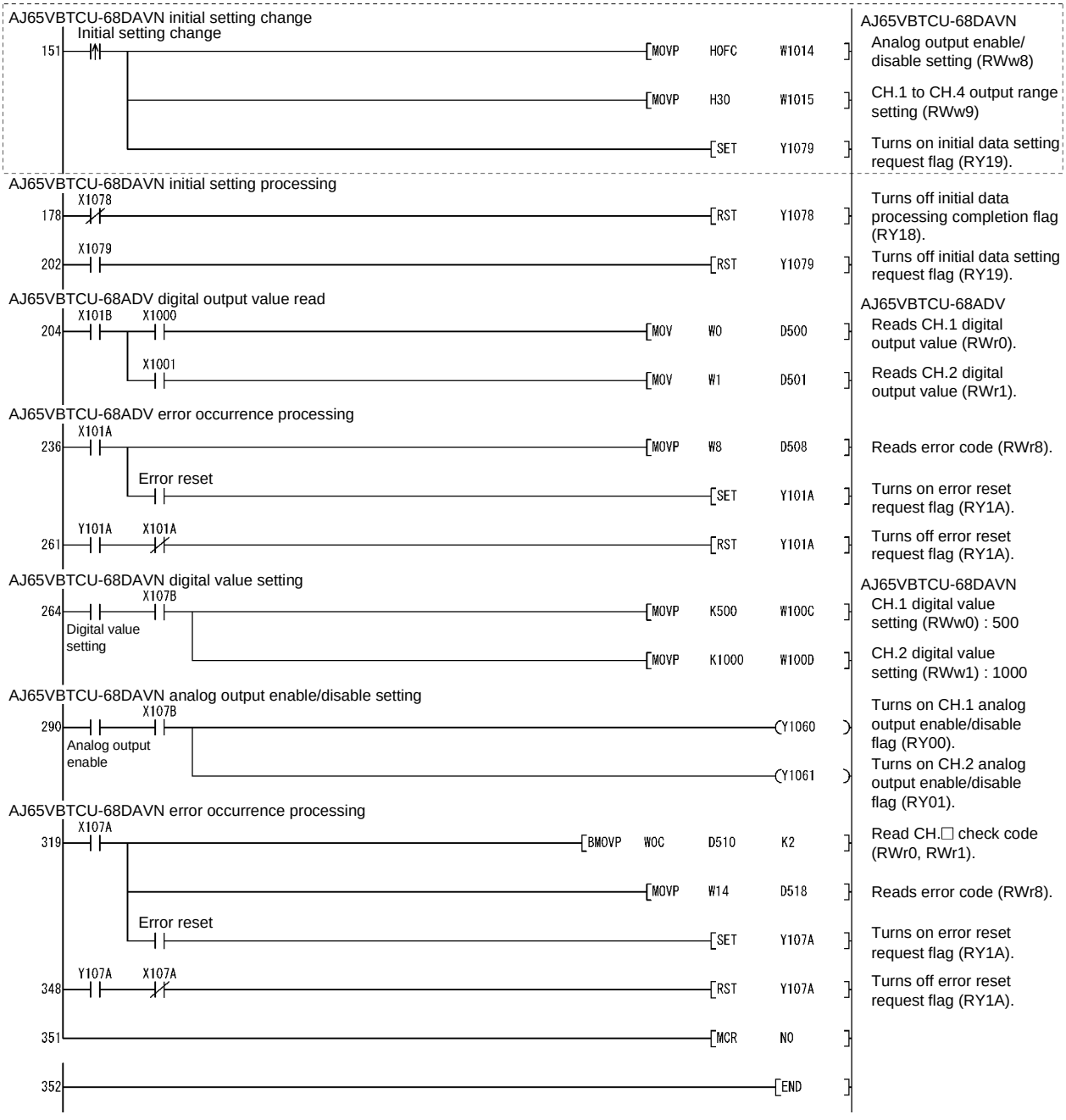



The program enclosed by the dotted line is necessary only when the initial settings are changed.

(To the next page)

REMARK

(From the previous page)




The program enclosed by the dotted line is necessary only when the initial settings are changed.

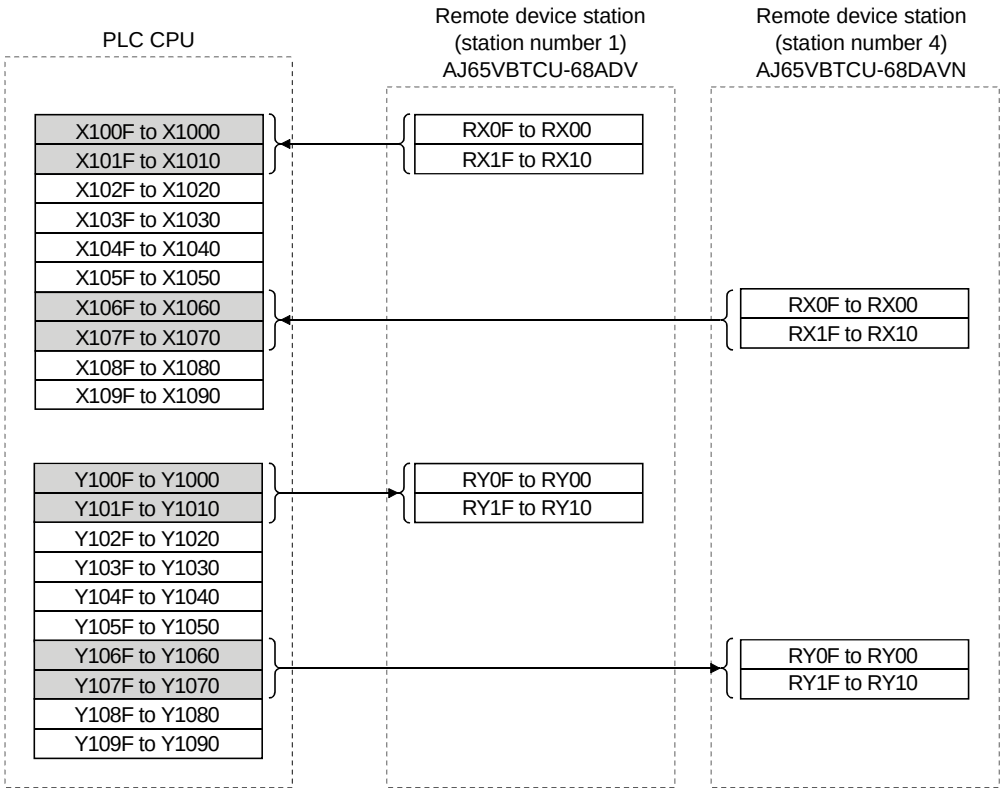


10 - 31

## 10.2.4 Creating a program

This section shows a program used to control remote device stations.
The following diagrams show the relationships of the remote input/output and remote registers between the PLC CPU devices and the remote device station.
The shaded areas indicate the devices that are actually used.
For detailed information about each remote device station, see the User's Manual for each module.

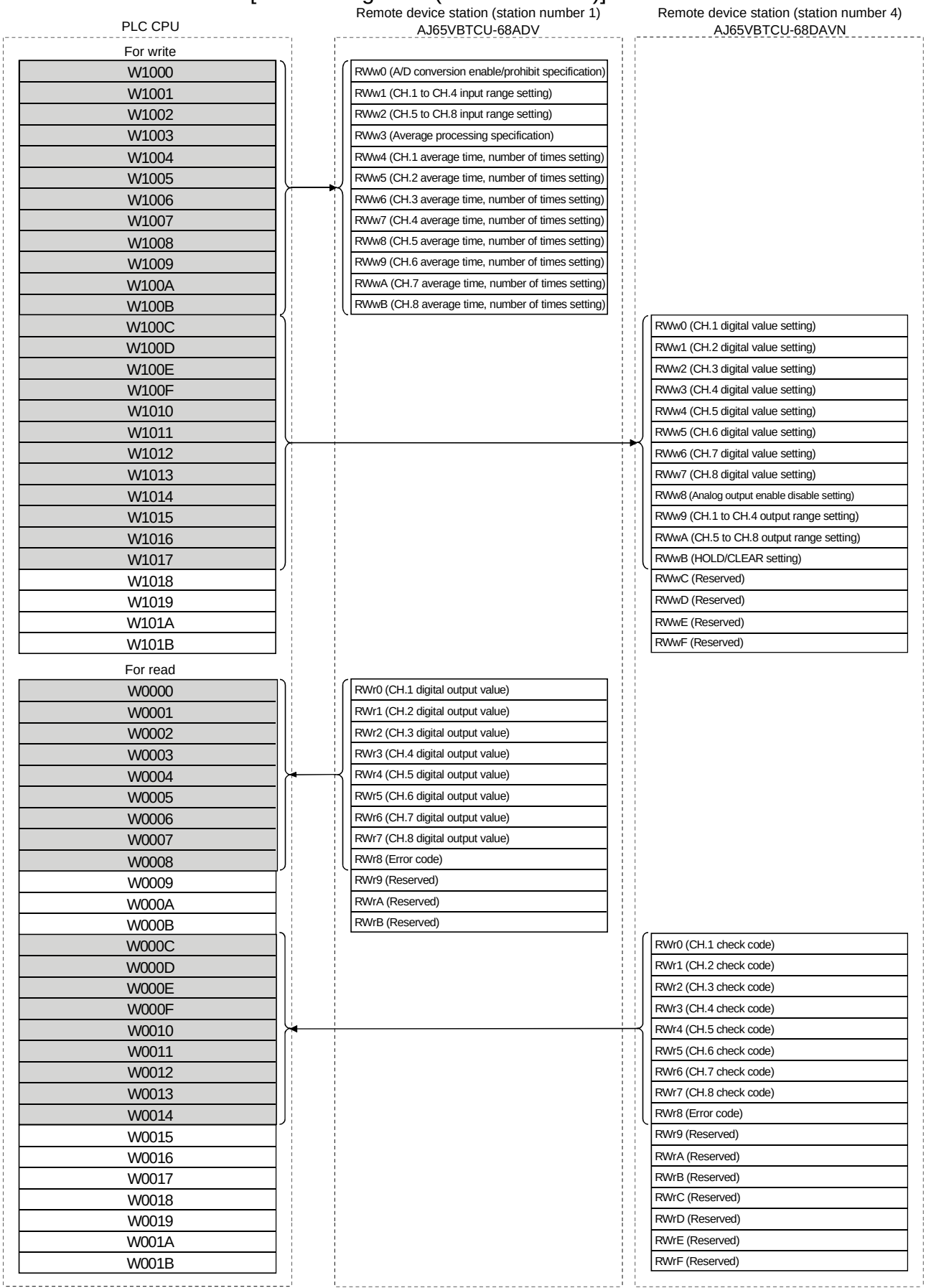
[Remote input (RX) and remote output (RY)]





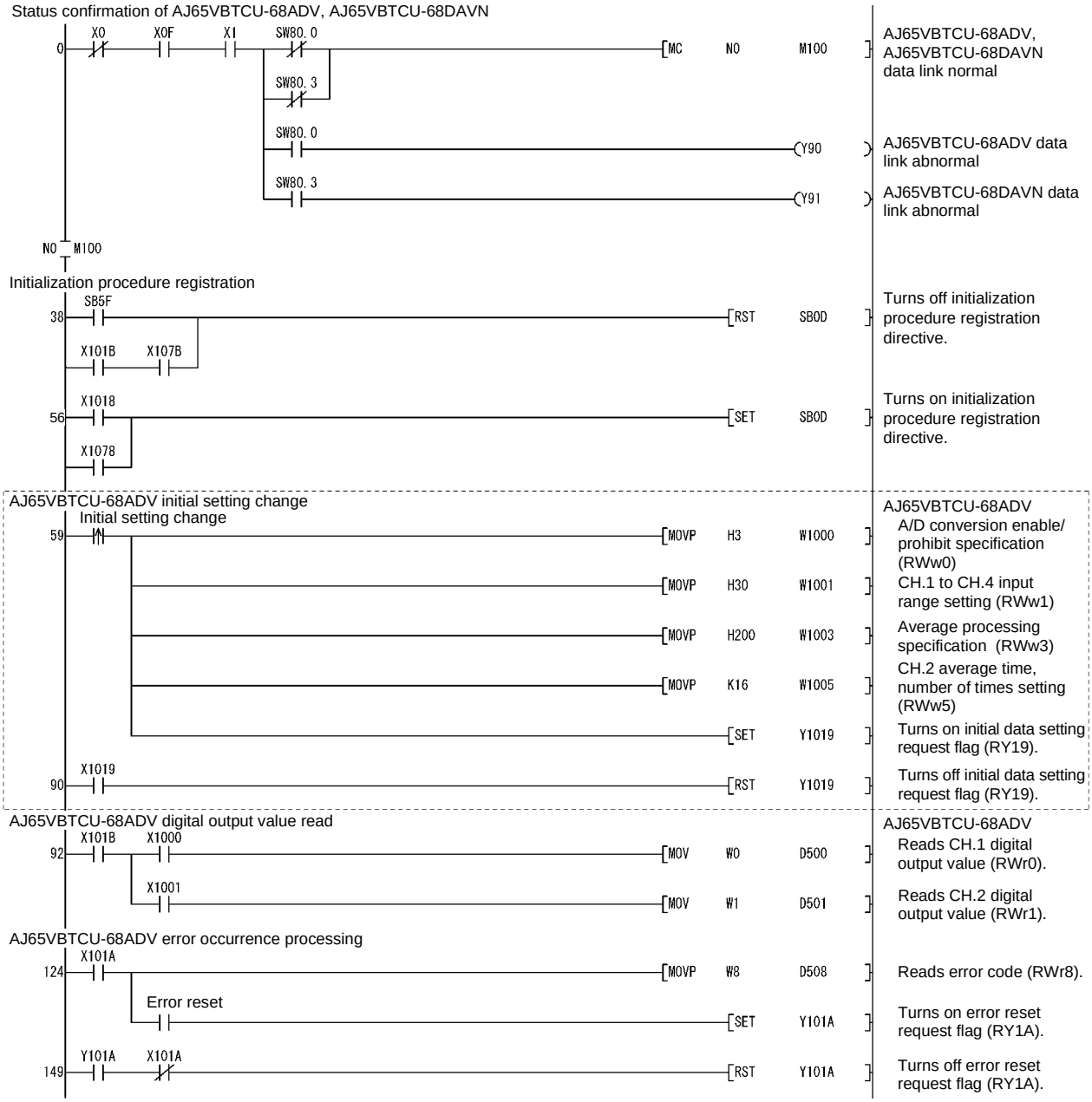
10 - 32

## [Remote registers (RWw and RWr)]



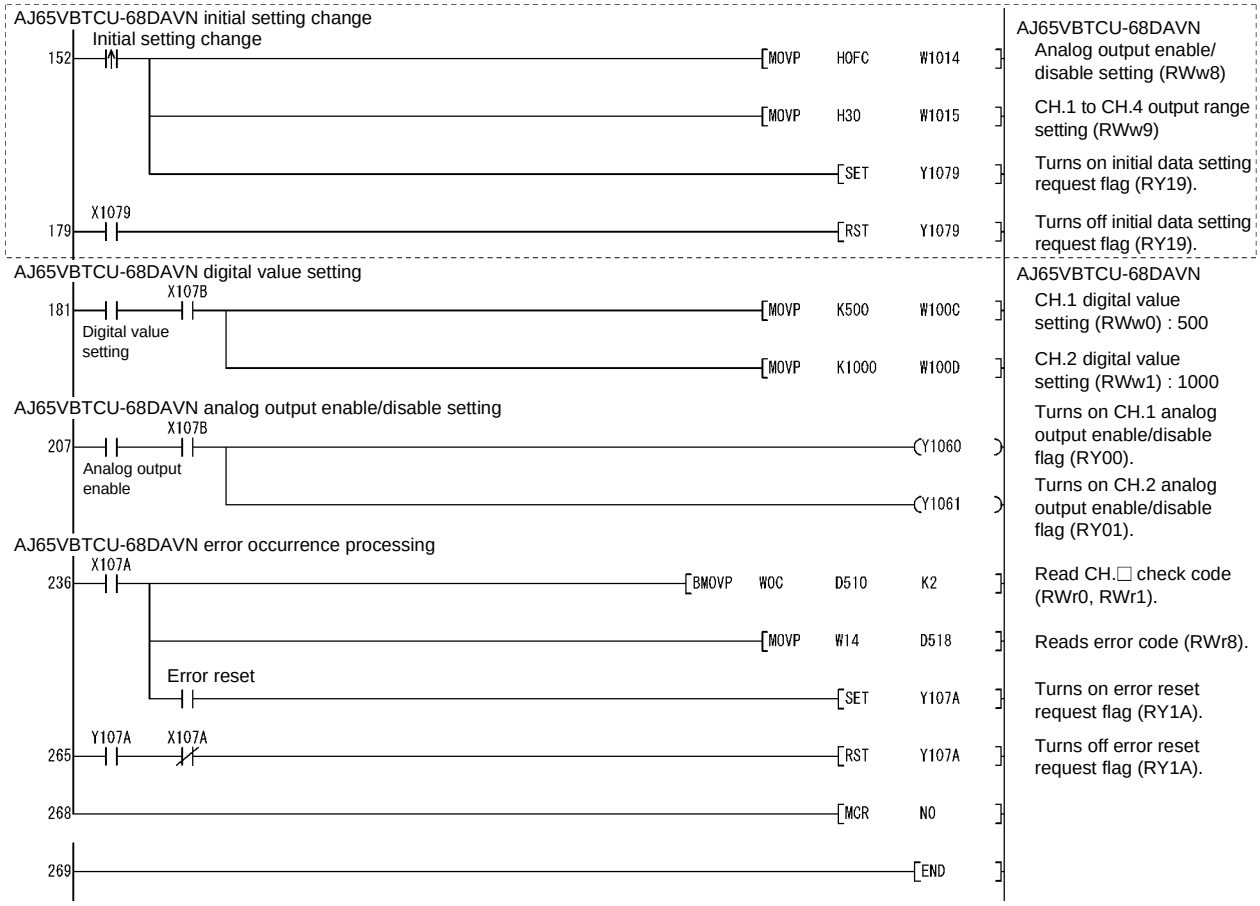



10 - 33




The program enclosed by the dotted line is necessary only when the initial settings are changed.


10 - 34




The program enclosed by the dotted line is necessary only when the initial settings are changed.

## 10.2.5 Performing the data link

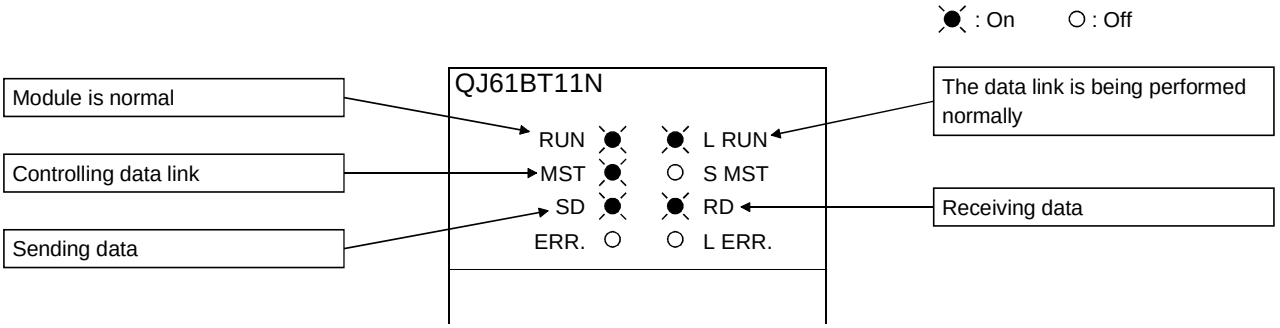
Turn on the power to the remote device station first, and then turn on the power to the master station to start the data link.

### (1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote device station when the data link is being performed normally.

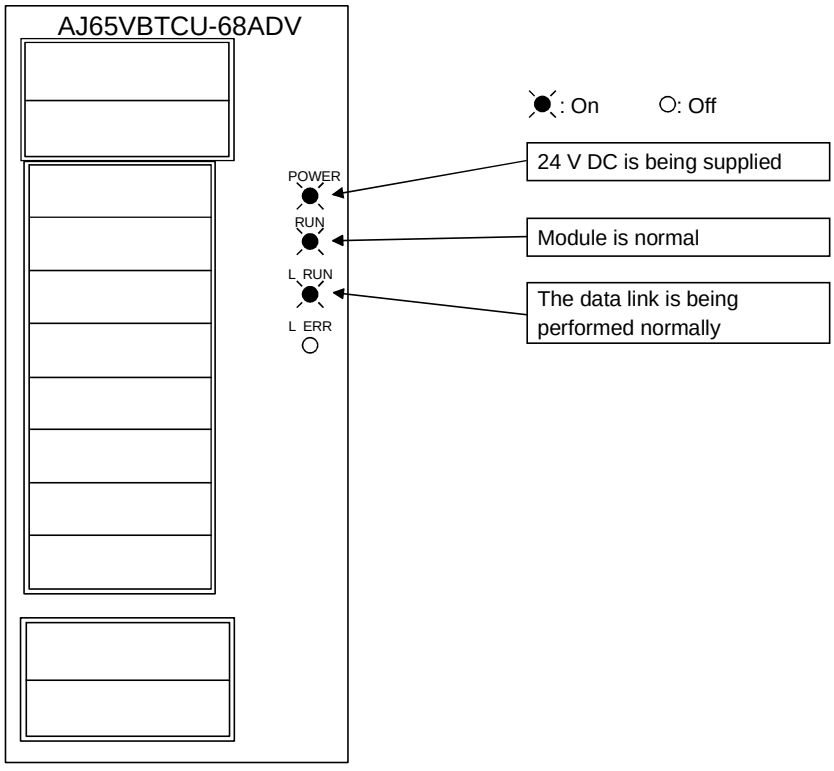
#### (a) LED display of the master station

Make sure that the LED display shows the following status:




#### (b) LED display of the remote device station

For both the AJ65VBTCU-68ADV and AJ65VBTCU-68DAVN, confirm that the LED display status is as shown below.



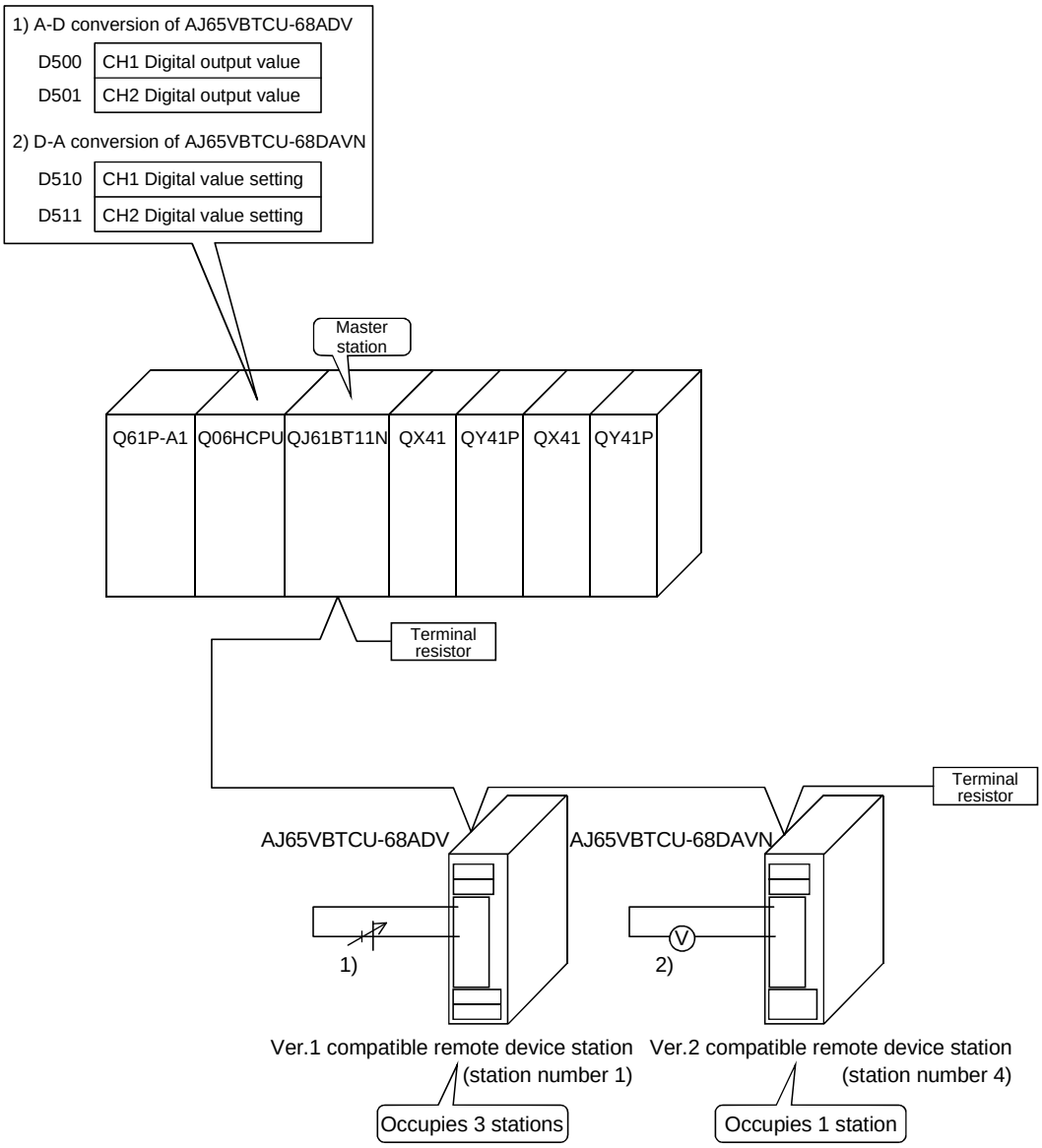


10 - 36

### (2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

1) Change the voltage input to the AJ65VBTCU-68ADV and confirm that the A-D converted digital value also changes.
2) Set digital values to the AJ65VBTCU-68DAVN, and confirm that the voltages converted from digital to analog are output.



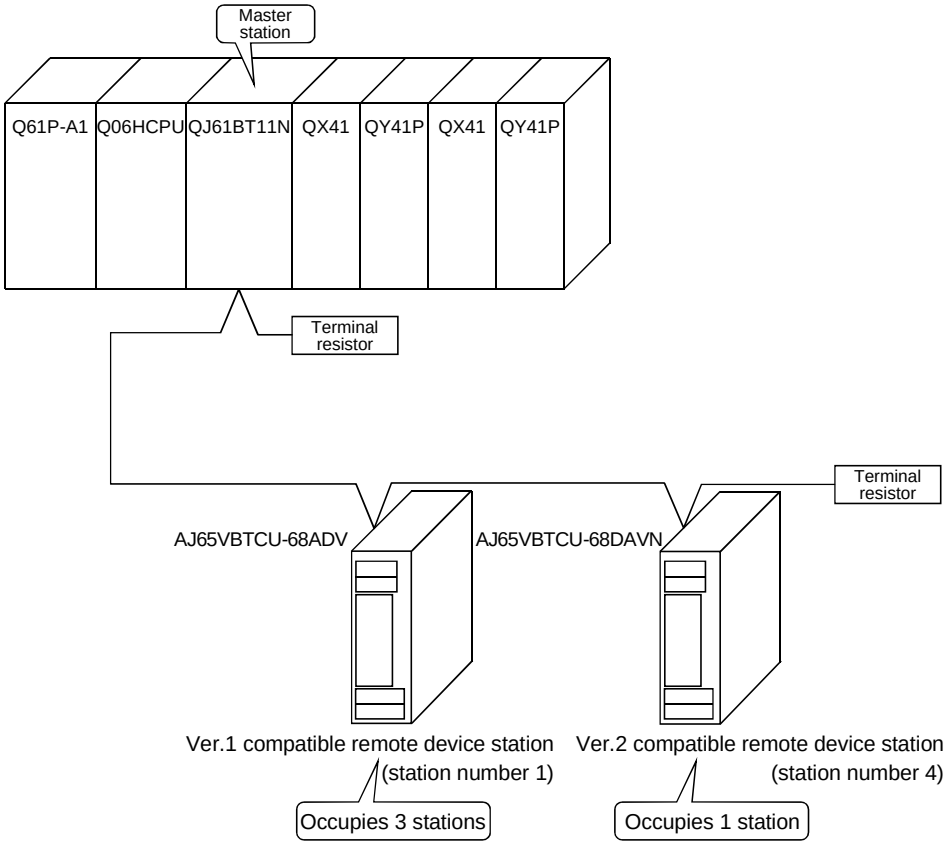


10 - 37

## 10.3 When Remote Net Additional Mode is Used

### 10.3.1 Configuring a system

As shown below, a system where one ver. 1 compatible remote device station and one ver. 2 compatible remote device station are connected is used as an example.

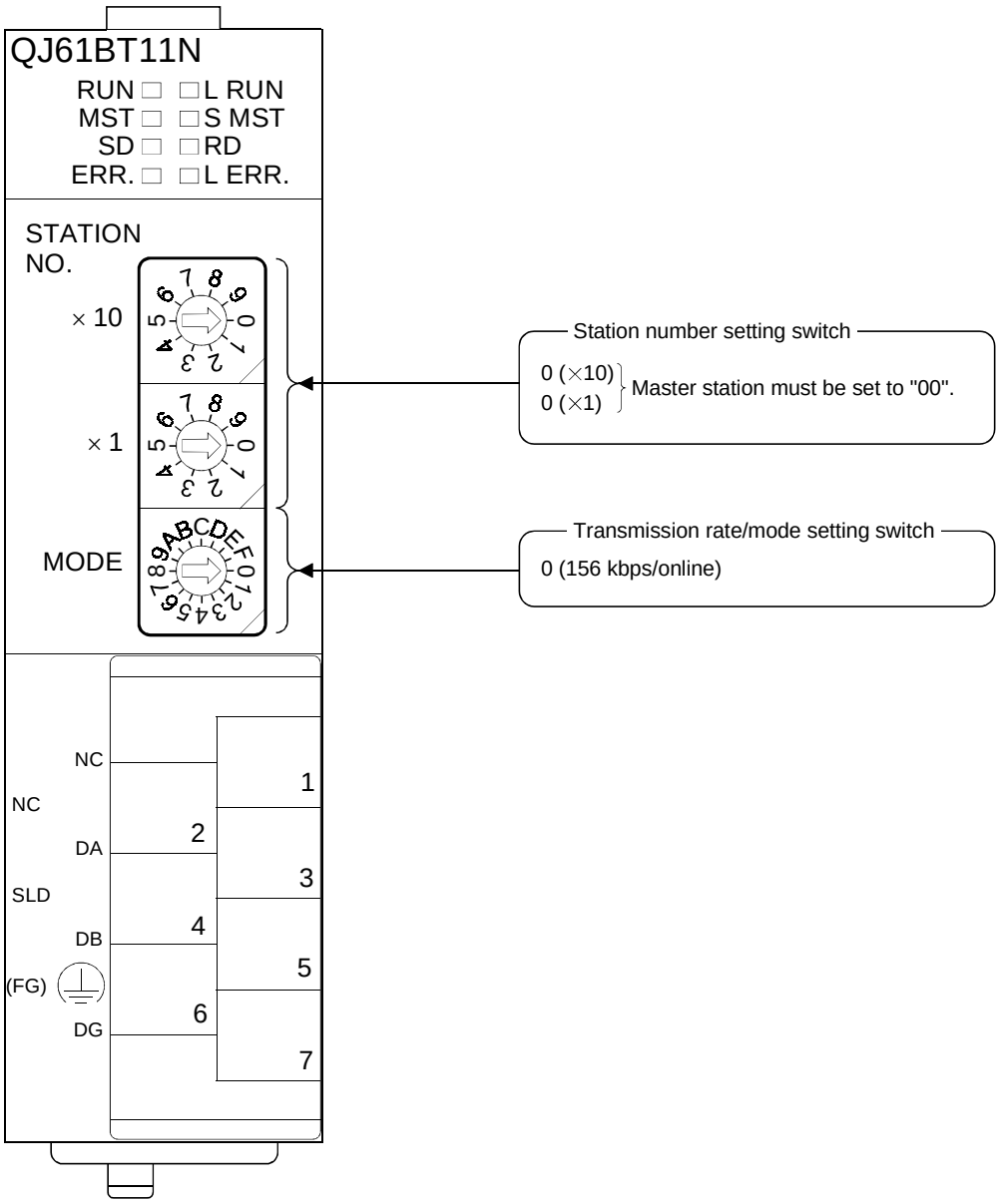




10 - 38

(1) Setting the master station

Settings of the master station switches are shown below:





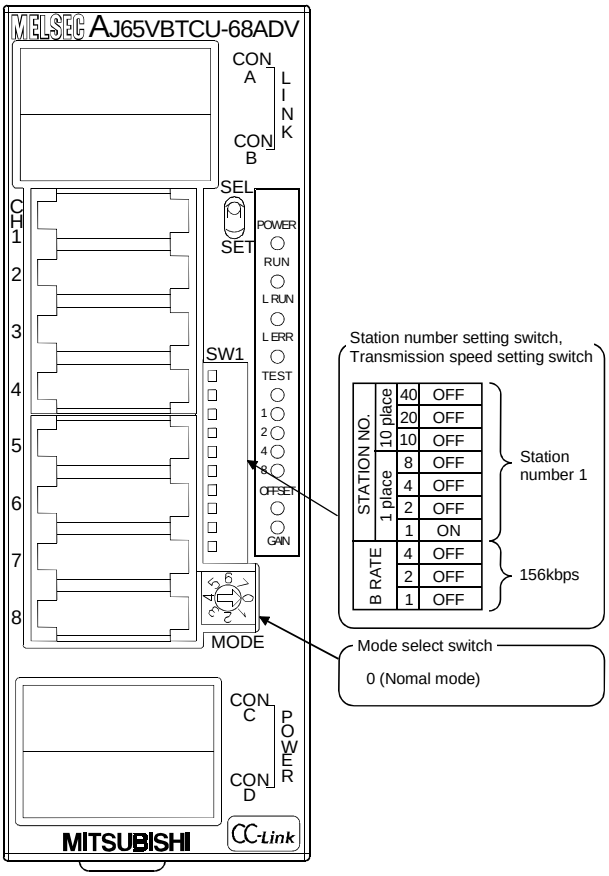

10 - 39

## (2) Setting the remote device station

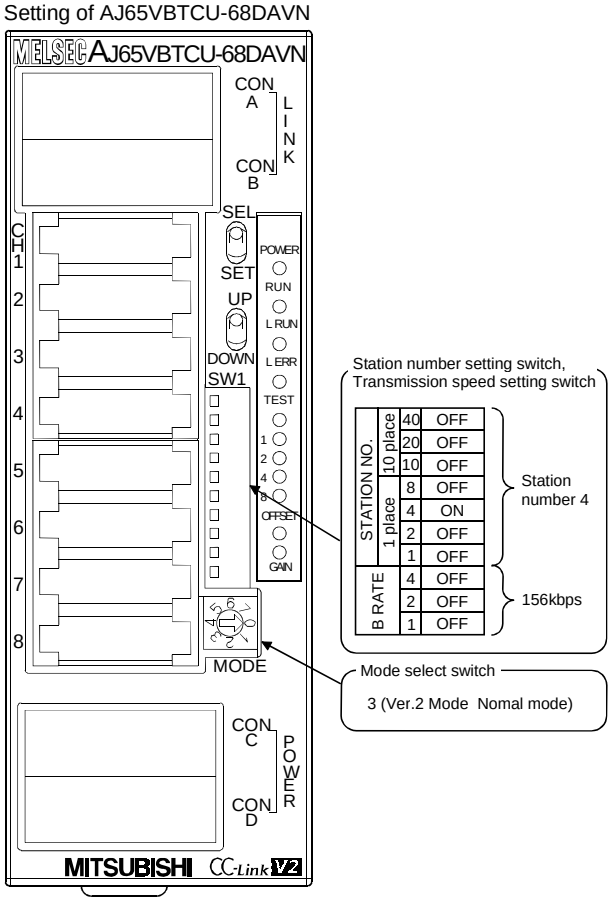
Settings of the remote device station switches are shown below:

For more detailed information about the contents of the settings, see the Remote Device Station User's Manual.

Setting of AJ65VBTCU-68ADV



Setting of AJ65VBTCU-68DAVN






10 - 41

## 10.3.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

### (1) Setting the network parameters of the master station

#### (a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

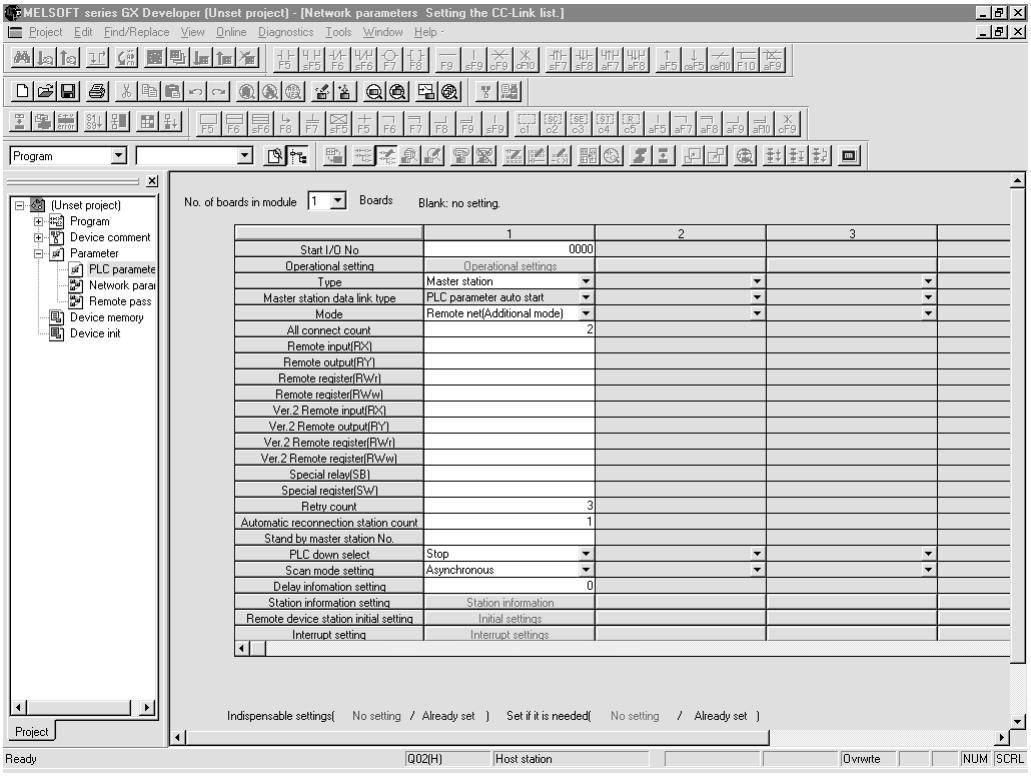
| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | (Mater station)<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>(Remote net (Additional mode))<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | 2 modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |

| Item | Setting range | Setting value |
|---|---|---|
| Retry count | 1 to 7<br>Default: 3 | 3 times |
| Automatic reconnection station count | 1 to 10<br>Default: 1 | 1 modules |
| Standby master station No. | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | Stop/continue<br>Default: Stop | (Stop)/continue |
| Scan mode setting | Asynchronous/synchronous<br>Default: Asynchronous | (Asynchronous)/synchronous |
| Delay information setting | Set 0. | |

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 1 | Ver.1Remote device station | single | Occupies 3 stations | 96 points | No setting | | | |
| | | | | | | | | |
| 4 | Ver.2Remote device station | quadruple | Occupies 1 station | 64 points | No setting | | | |
| | | | | | | | | |

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W100.

5) Set the refresh device for ver.2 remote input (RX) to X1500.

6) Set the refresh device for ver.2 remote output (RY) to Y1500.

7) Set the refresh device for ver.2 remote register (RWr) to W1000.

8) Set the refresh device for ver.2 remote register (RWw) to W1500.

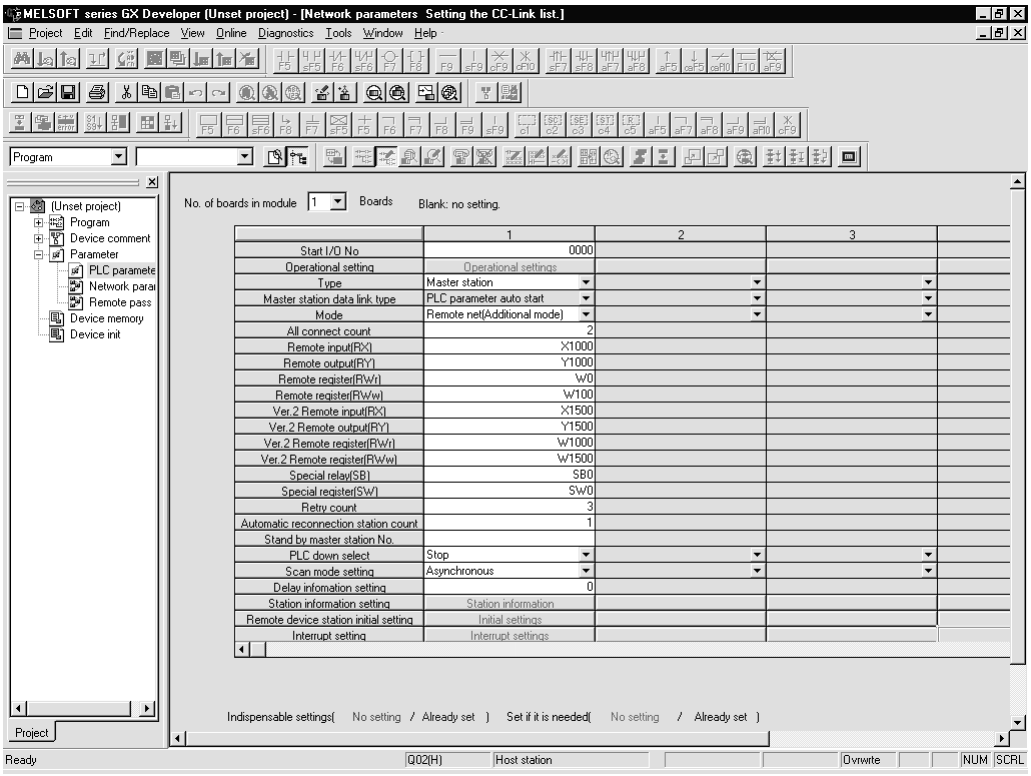
9) Set the refresh device for special relay (SB) to SB0.

10) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

A setting example is shown below.



## 10.3.3 Initial setting of the remote device station

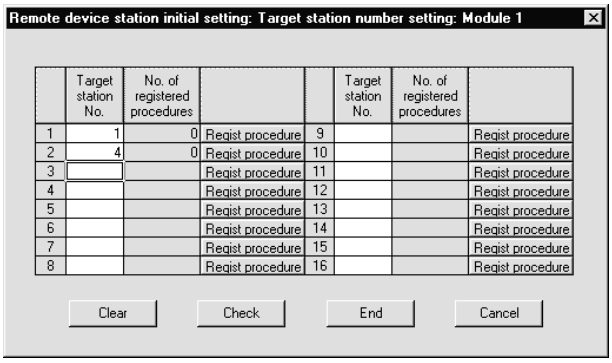
This section explains the initial setting of the remote device station.

### (1) Setting the target station number

Set the target station for which the initial setting is performed.

#### (a) Setting the target station number

Set the target station numbers to "1" and "4".




#### (b) Selecting the Regist procedure

Click the "Regist procedure" of the target station number "1".

### (2) Setting the regist procedure registration

Set the conditions and details of the remote device station settings.
In this section, AJ65VBTCU-68ADV is used as an example for the Regist procedure registration.
The details to be set are as follows:

- Set channels 1, 2 to A-D conversion enable (the first condition).
- Set the Input range of channel 1 to 0 - 5V, and channel 2 to User range setting 1 (the second condition).
- Set channel 1 to Sampling processing, and specify channel 2 as Average processing and set it to Number of times (the third condition).
- Set channel 2 Average number of times to 16 times (the forth condition).
- Turn the Initial data processing completed flag to ON (the fifth condition).
- Turn the Initial data setting request flag to ON (the sixth condition).
- Turn the Initial data processing completed flag to OFF (the seventh condition).
- Turn the Initial data setting request flag to OFF (the eighth condition).

For more detailed information about the settings, see the Remote Device Station User's Manual.

Set the input format to "HEX.".

#### (a) Setting the first condition

##### 1) Execute Flag setting

Set the "Execute Flag" to "Execute".

##### 2) Operational condition setting

Set the "Operational condition" to "Set new".


10 - 45

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "ON".

4) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "00", and the "Write Data" to "0003".

(b) Setting the second condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "01", and "Write Data" to "0031".

(c) Setting the third condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw" ,the "Device Number" to "03", and the "Write Data" to "0200".

(d) Setting the fourth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "05", and the "Write Data" to "0010".

(e) Setting the fifth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "ON".

(f) Setting the sixth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting
Set "Write Device" to "RY", the "Device Number" to "19", and the "Write Data" to "ON".

(g) Setting the seventh condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "OFF".

4) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "OFF".

(h) Setting the eighth condition

1) Execute Flag setting
Set the "Execute Flag" to "Execute".

2) Operational condition setting
Set the "Operational condition" to "Set new".

3) Executional condition settings
Set the "Condition Device" to "RX", the "Device Number" to "19", and the "Execute Condition" to "ON".

4) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "19", and the "Write Data" to "OFF".

(i) Setting results

The results of settings (a) to (h) are shown below.

**Remote device station initial setting: Procedure registration module 1: Target station 1**

Input format: HEX.

| Execute Flag | Operational condition | Executional condition: Condition Device | Executional condition: Device Number | Executional condition: Execute Condition | Details of execution: Write Device | Details of execution: Device Number | Details of execution: Write Data |
|---|---|---|---|---|---|---|---|
| Execute | Set new | RX | 18 | ON | RWw | 00 | 0003 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 01 | 0031 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 03 | 0200 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 05 | 0010 |
| Execute | Same as prev.set | RX | 18 | ON | RY | 18 | ON |
| Execute | Same as prev.set | RX | 18 | ON | RY | 19 | ON |
| Execute | Set new | RX | 18 | OFF | RY | 18 | OFF |
| Execute | Set new | RX | 19 | ON | RY | 19 | OFF |

Similarly, make the procedure registration of the AJ65VBTCU-68DAVN.
Click the "Regist procedure" of the target station number "4".

The details to be set are as follows:

- Set channels 1, 2 to Analog output enable. (the first condition)
- Set the Output range of channel 1 to 0 - 5V, and channel 2 to User range setting 1. (the second condition)
- Set the HOLD/CLEAR setting of channels 1, 2 to CLEAR. (the third condition)
- Turn the Initial data processing completed flag to ON (the forth condition).
- Turn the Initial data setting request flag to ON (the fifth condition).
- Turn the Initial data processing completed flag to OFF (the sixth condition).
- Turn the Initial data setting request flag to OFF (the seventh condition).

**Remote device station initial setting: Procedure registration module 1: Target station 4**

Input format: HEX.

| Execute Flag | Operational condition | Executional condition: Condition Device | Executional condition: Device Number | Executional condition: Execute Condition | Details of execution: Write Device | Details of execution: Device Number | Details of execution: Write Data |
|---|---|---|---|---|---|---|---|
| Execute | Set new | RX | 18 | ON | RWw | 08 | 00FC |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 09 | 0031 |
| Execute | Same as prev.set | RX | 18 | ON | RWw | 0B | 0000 |
| Execute | Same as prev.set | RX | 18 | ON | RY | 18 | ON |
| Execute | Same as prev.set | RX | 18 | ON | RY | 19 | ON |
| Execute | Set new | RX | 18 | OFF | RY | 18 | OFF |
| Execute | Set new | RX | 19 | ON | RY | 19 | OFF |


10 - 48

### (3) Validating the remote device station initial settings

This section explains the link special relays (SB) relating to the initial settings of remote device stations.
Numeric values in parentheses in the Number column indicate addresses and bit positions of the buffer memory.

Example: For buffer memory address 5E0H and bit 13: (5E0H, b13)

Table 10.3 List of link special relays related to remote device station initial settings

| Number | Name | Description | Availability (○: Available, ×: Not available) | | |
|---|---|---|---|---|---|
| | | | Online | | Offline |
| | | | Master station | Local station | |
| SB000D (5E0H, b13) | Remote device station initialization procedure registration instruction | Starts initial processing using the information registered during the initialization procedure registration.<br>While SB000D is on, the refresh of the remote input/output and remote registers stops.<br>OFF: No instruction<br>ON: Instructed | ○ * | × | × |
| SB005E (5E5H, b14) | Execution status of remote device station initialization procedure | Indicates the execution status of the initialization procedure.<br>OFF: Not executed<br>ON: Being executed | ○ * | × | × |
| SB005F (5E0H, b15) | Complete status of remote device station initialization procedure | Indicates completion status of the execution of the initialization procedure execution.<br>OFF: Not complete<br>ON: Complete | ○ * | × | × |
| SW005F (65FH) | Remote device station initialization procedure instruction result | Stores the execution result of initialization procedure registration instruction with SB000B.<br>0: Normal<br>Other than 0: Store the error code (see Section 13.3). | ○ * | × | × |

* Cannot be used for the standby master station that is controlling the data link.

For details on how to create a program, see Section 10.3.4.

**POINT**

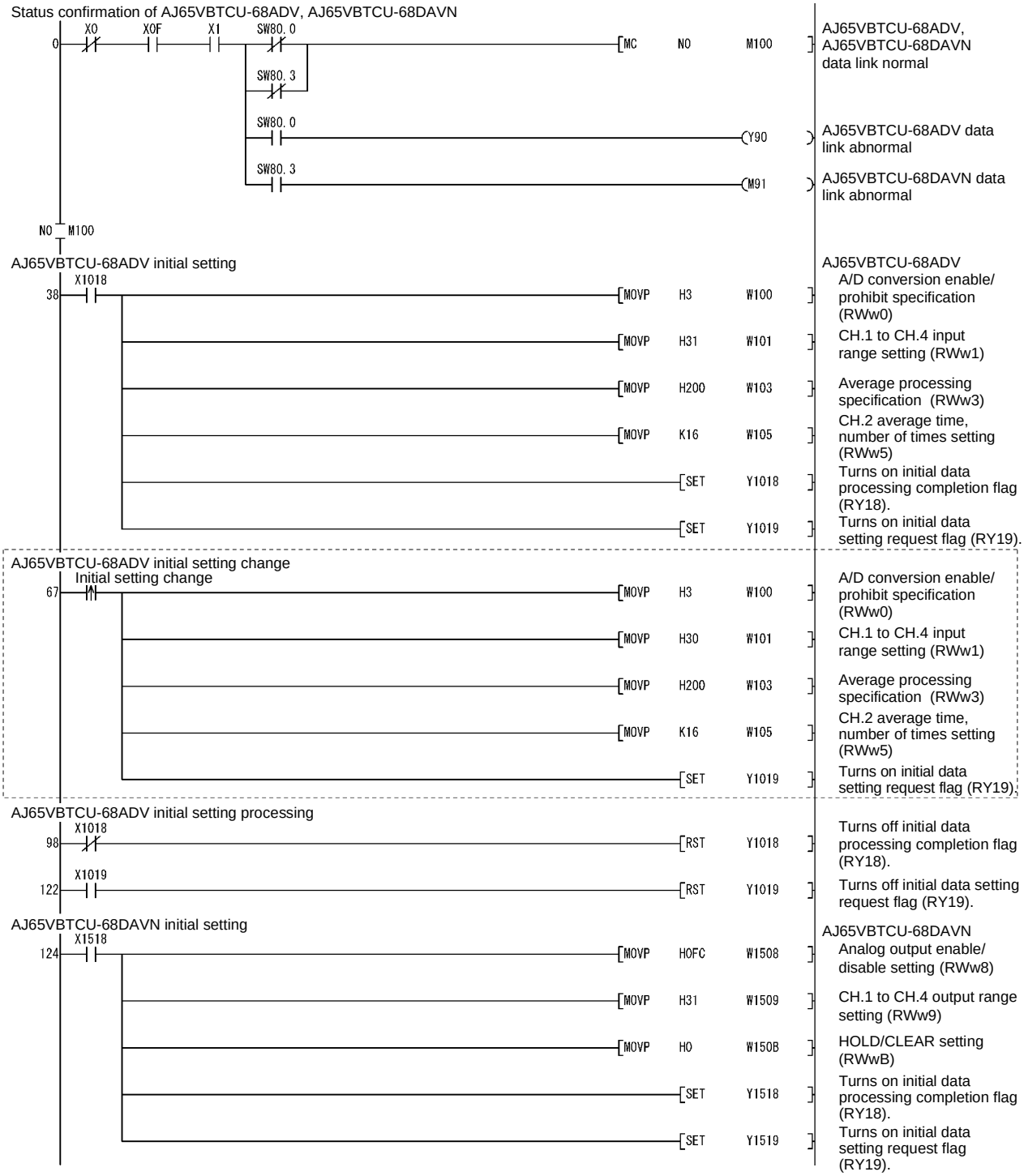
(1) When remote device station initialization procedure registration instruction (SB0000) is turned off after the initial processing completion, all of the RY signals that has been turned on in the initial procedure registration is turned off. Therefore, about signals that are required to turn always on, such as conversion valid signal, they should be turned on in the sequence program.

(2) If the procedure registration is not completed for all stations registered to the remote device station initialization procedure registration, the completion status of remote device station initialization procedure (SB005F) does not turn on.
If there is a faulty station, turn off the remote device station initialization procedure registration instruction (SB000D) according to the completion status of the other stations.

REMARK

Setting with the sequence program (Reference)

For reference, an example setting performed with the sequence program is shown below.

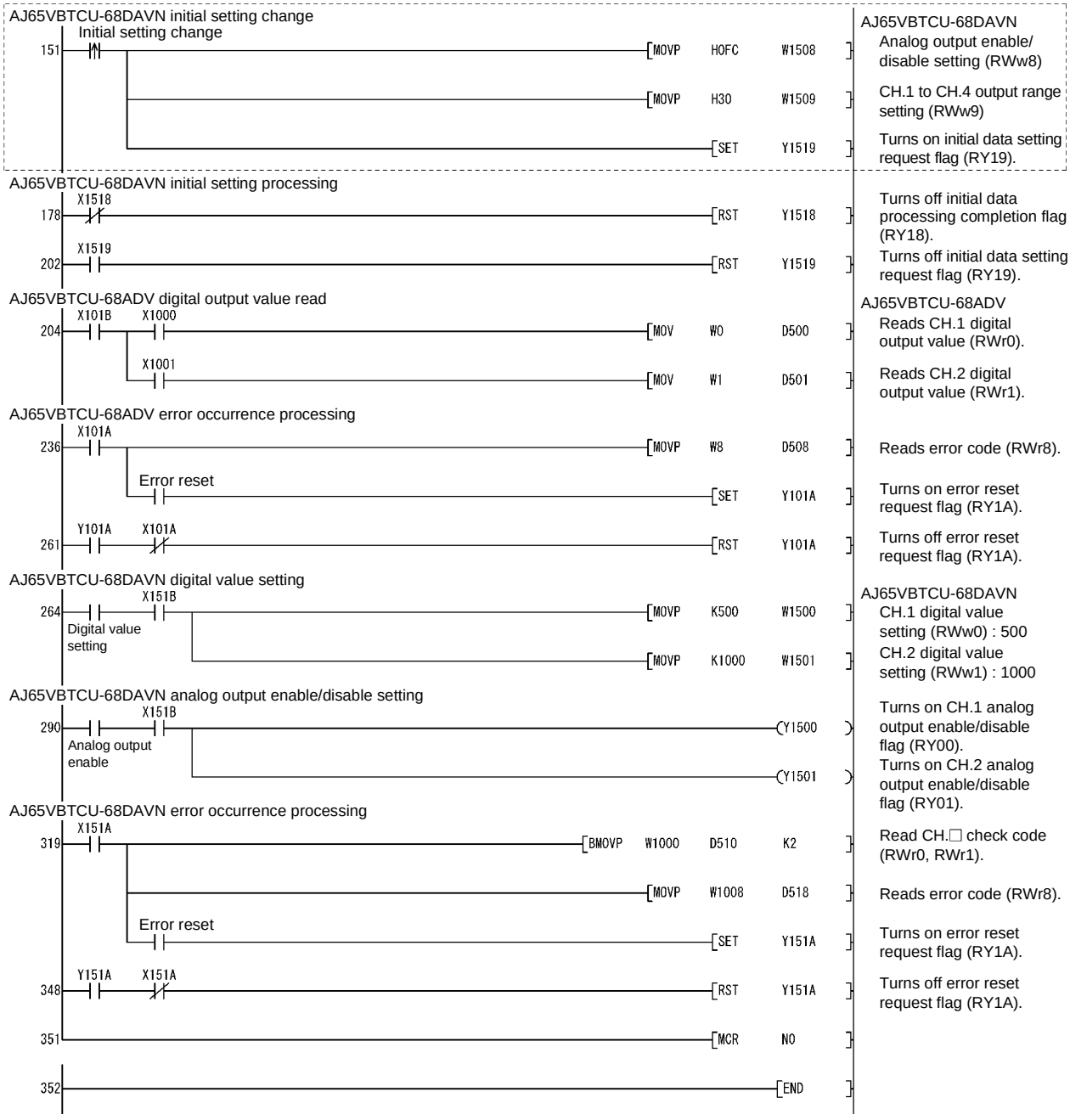

Status confirmation of AJ65VBTCU-68ADV, AJ65VBTCU-68DAVN
X0 X0F X1 SW80.0 MC N0 M100
SW80.3
SW80.0 Y90
SW80.3 M91
AJ65VBTCU-68ADV, AJ65VBTCU-68DAVN data link normal
AJ65VBTCU-68ADV data link abnormal
AJ65VBTCU-68DAVN data link abnormal
N0 M100
AJ65VBTCU-68ADV initial setting
X1018
MOVP H3 W100
MOVP H31 W101
MOVP H200 W103
MOVP K16 W105
SET Y1018
SET Y1019
AJ65VBTCU-68ADV
A/D conversion enable/ prohibit specification (RWw0)
CH.1 to CH.4 input range setting (RWw1)
Average processing specification (RWw3)
CH.2 average time, number of times setting (RWw5)
Turns on initial data processing completion flag (RY18).
Turns on initial data setting request flag (RY19).
AJ65VBTCU-68ADV initial setting change
Initial setting change
MOVP H3 W100
MOVP H30 W101
MOVP H200 W103
MOVP K16 W105
SET Y1019
A/D conversion enable/ prohibit specification (RWw0)
CH.1 to CH.4 input range setting (RWw1)
Average processing specification (RWw3)
CH.2 average time, number of times setting (RWw5)
Turns on initial data setting request flag (RY19).
AJ65VBTCU-68ADV initial setting processing
X1018 RST Y1018
X1019 RST Y1019
Turns off initial data processing completion flag (RY18).
Turns off initial data setting request flag (RY19).
AJ65VBTCU-68DAVN initial setting
X1518
MOVP HOFC W1508
MOVP H31 W1509
MOVP HO W150B
SET Y1518
SET Y1519
AJ65VBTCU-68DAVN
Analog output enable/ disable setting (RWw8)
CH.1 to CH.4 output range setting (RWw9)
HOLD/CLEAR setting (RWwB)
Turns on initial data processing completion flag (RY18).
Turns on initial data setting request flag (RY19).

The program enclosed by the dotted line is necessary only when the initial settings are changed.

(To the next page)

REMARK

(From the previous page)




The program enclosed by the dotted line is necessary only when the initial settings are changed.

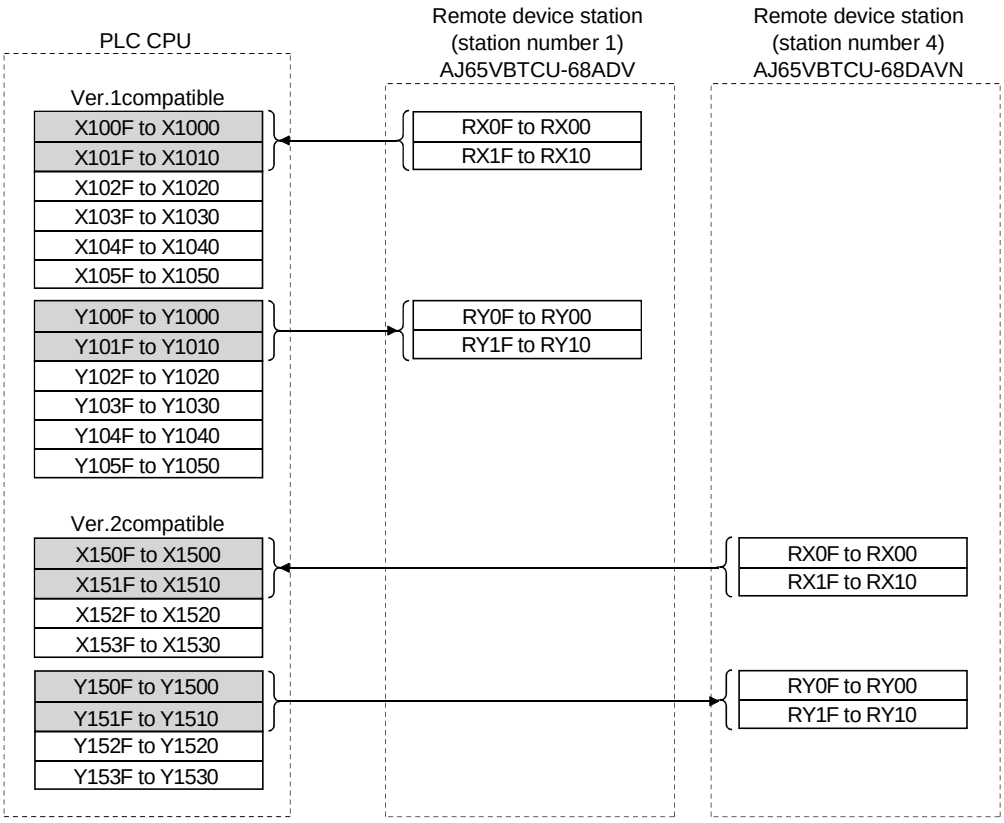


10 - 51

## 10.3.4 Creating a program

This section shows a program used to control remote device stations.
The following diagrams show the relationships of the remote input/output and remote registers between the PLC CPU devices and the remote device station.
The shaded areas indicate the devices that are actually used.
For detailed information about each remote device station, see the User's Manual for each module.

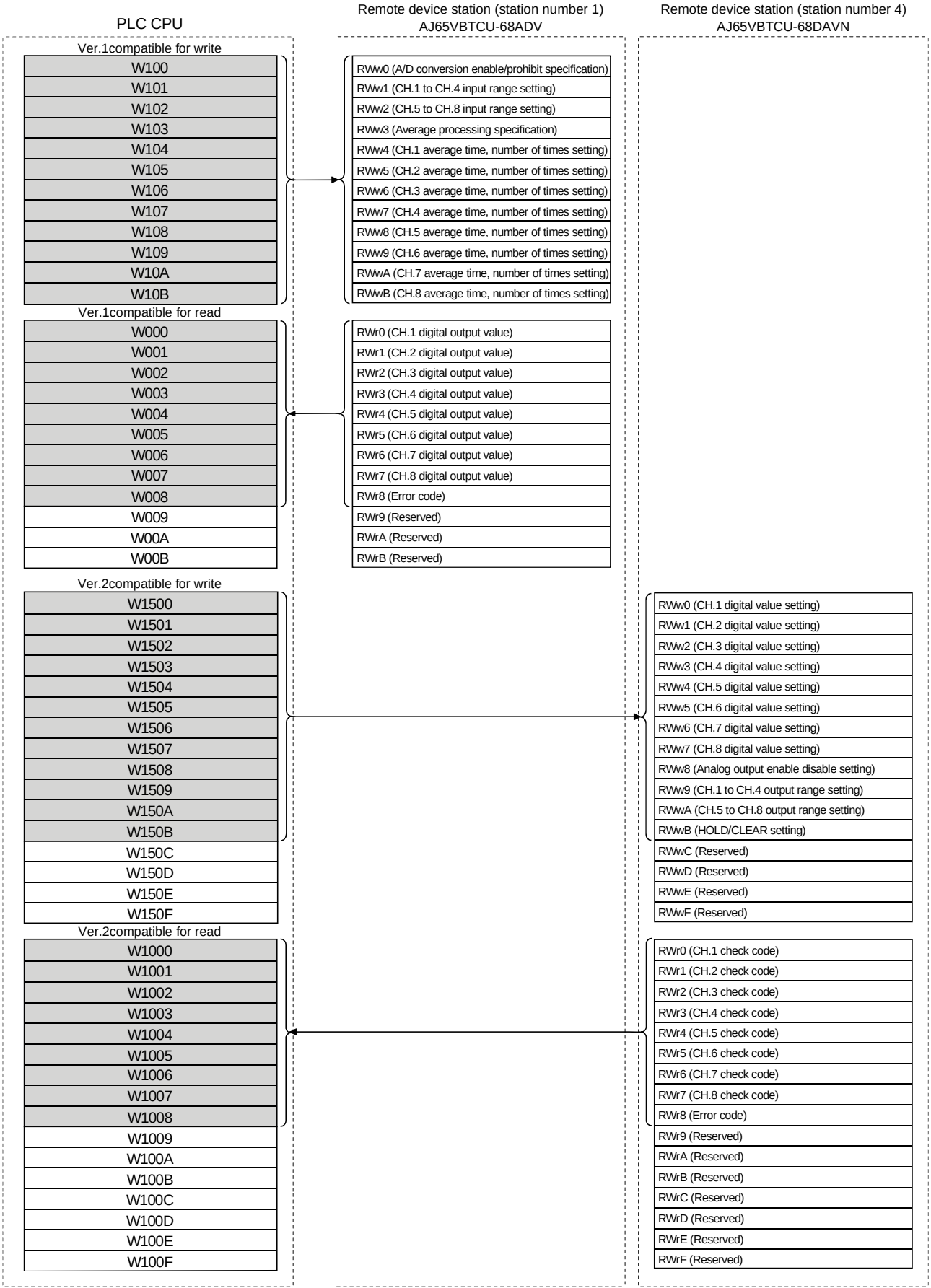
[Remote input (RX) and remote output (RY)]





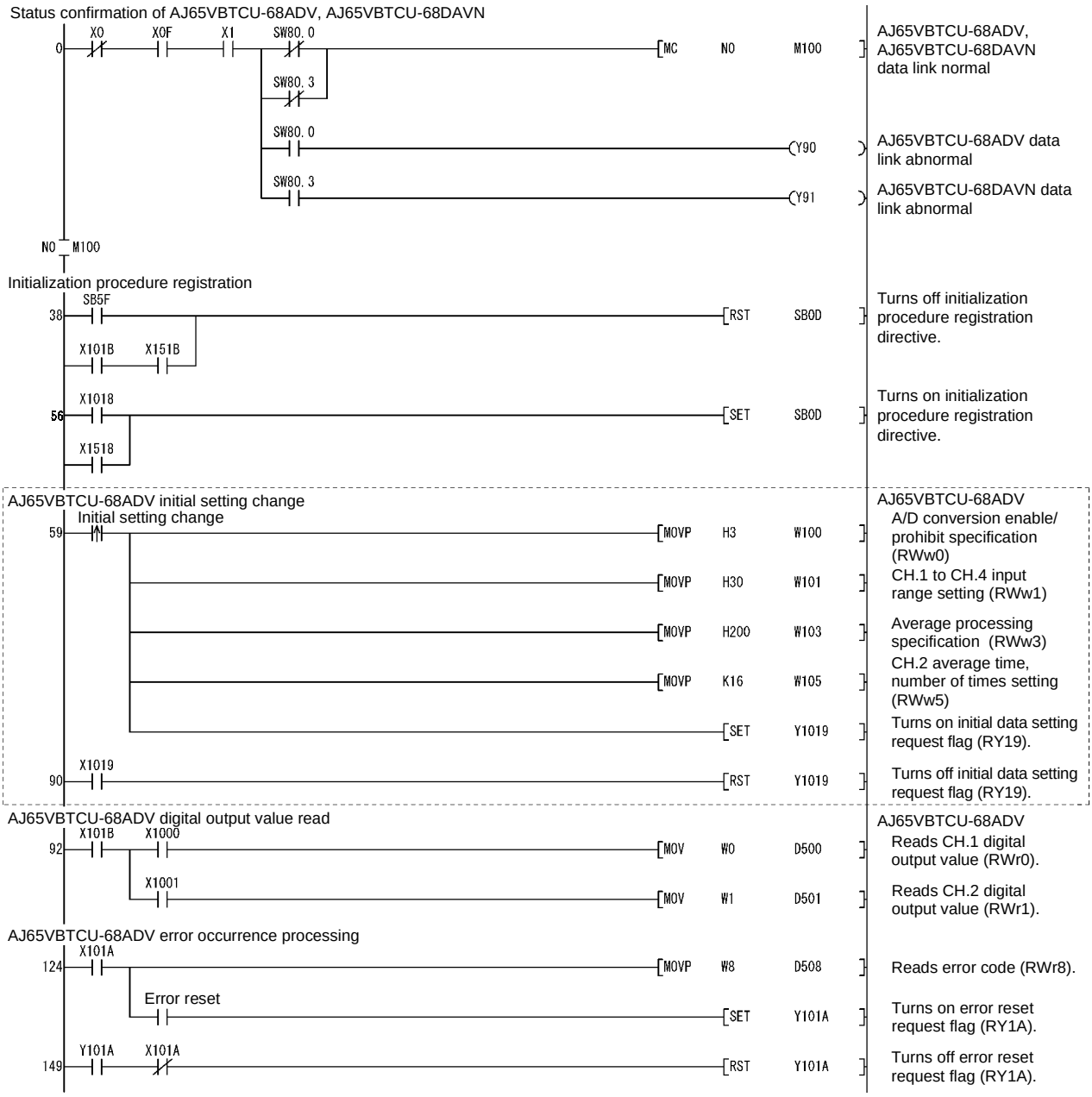
10 - 52

## [Remote registers (RWw and RWr)]

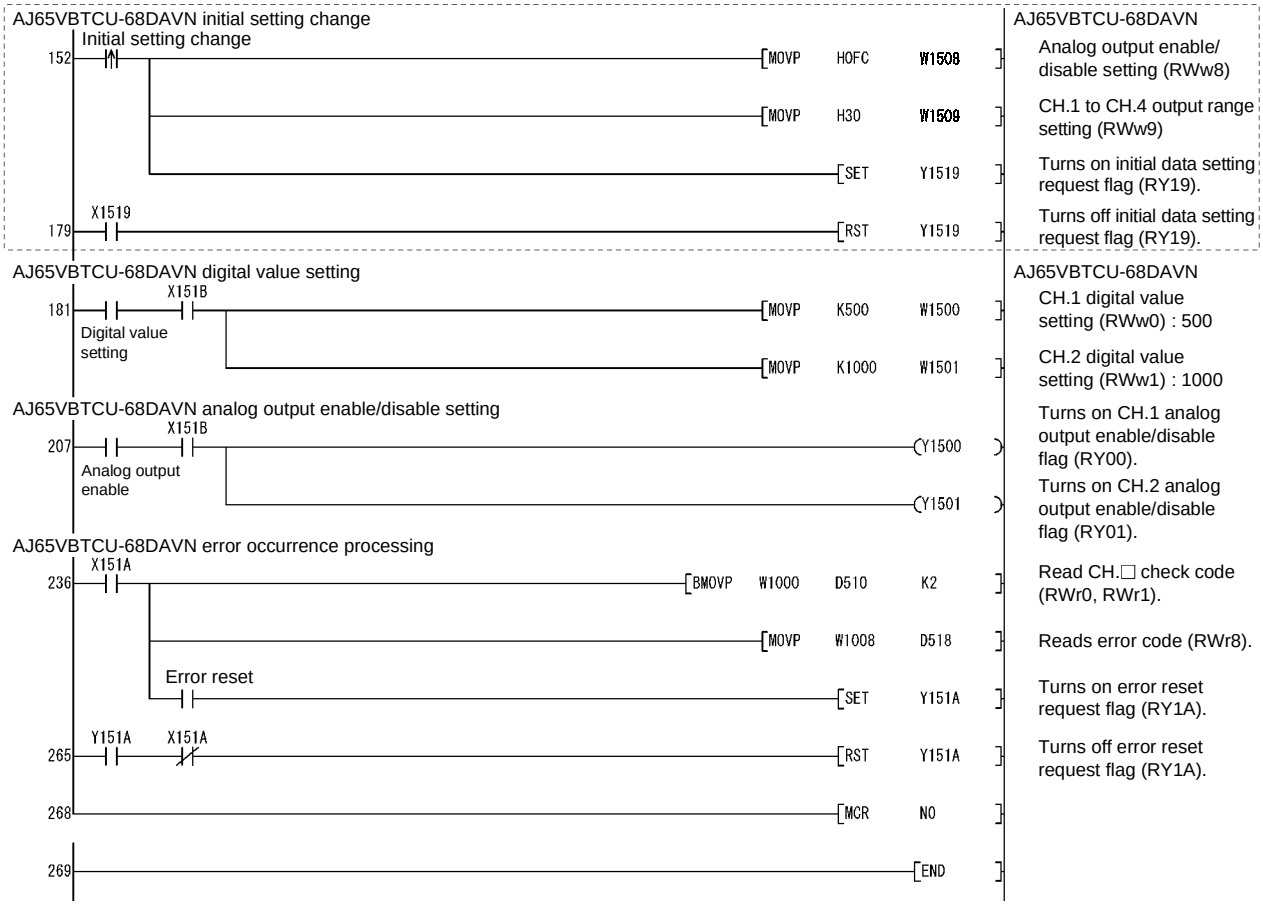




10 - 53


Status confirmation of AJ65VBTCU-68ADV, AJ65VBTCU-68DAVN
X0 X0F X1 SW80.0 MC N0 M100
SW80.3
SW80.0 Y90
SW80.3 Y91
AJ65VBTCU-68ADV, AJ65VBTCU-68DAVN data link normal
AJ65VBTCU-68ADV data link abnormal
AJ65VBTCU-68DAVN data link abnormal
N0 M100
Initialization procedure registration
SB5F RST SB0D
X101B X151B
X1018 SET SB0D
X1518
Turns off initialization procedure registration directive.
Turns on initialization procedure registration directive.
AJ65VBTCU-68ADV initial setting change
Initial setting change
MOVP H3 W100
MOVP H30 W101
MOVP H200 W103
MOVP K16 W105
SET Y1019
X1019 RST Y1019
AJ65VBTCU-68ADV
A/D conversion enable/ prohibit specification (RWw0)
CH.1 to CH.4 input range setting (RWw1)
Average processing specification (RWw3)
CH.2 average time, number of times setting (RWw5)
Turns on initial data setting request flag (RY19).
Turns off initial data setting request flag (RY19).
AJ65VBTCU-68ADV digital output value read
X101B X1000 MOV W0 D500
X1001 MOV W1 D501
AJ65VBTCU-68ADV
Reads CH.1 digital output value (RWr0).
Reads CH.2 digital output value (RWr1).
AJ65VBTCU-68ADV error occurrence processing
X101A MOVP W8 D508
Error reset SET Y101A
Y101A X101A RST Y101A
Reads error code (RWr8).
Turns on error reset request flag (RY1A).
Turns off error reset request flag (RY1A).

The program enclosed by the dotted line is necessary only when the initial settings are changed.




The program enclosed by the dotted line is necessary only when the initial settings are changed.

## 10.3.5 Performing the data link

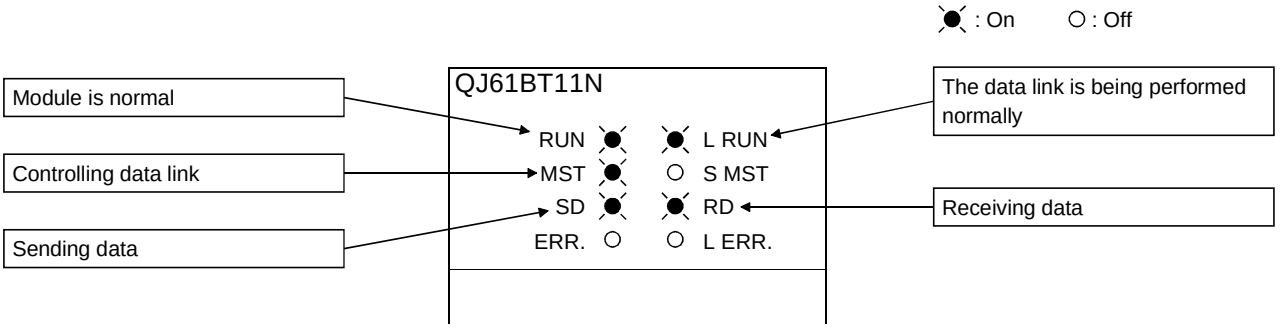
Turn on the power to the remote device station first, and then turn on the power to the master station to start the data link.

### (1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote device station when the data link is being performed normally.

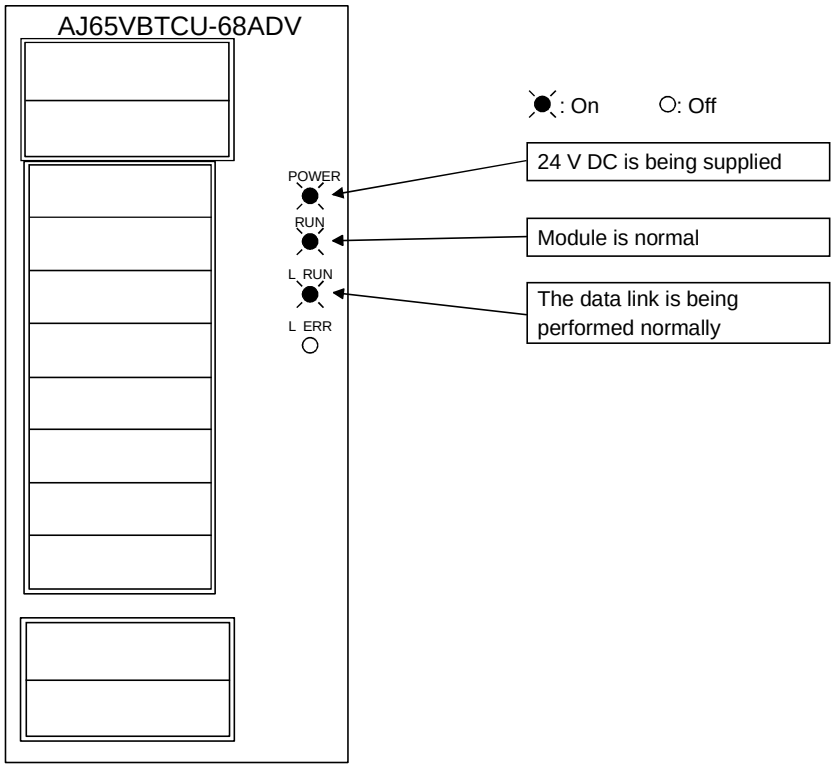
#### (a) LED display of the master station

Make sure that the LED display shows the following status:




#### (b) LED display of the remote device station

For both the AJ65VBTCU-68ADV and AJ65VBTCU-68DAVN, confirm that the LED display status is as shown below.



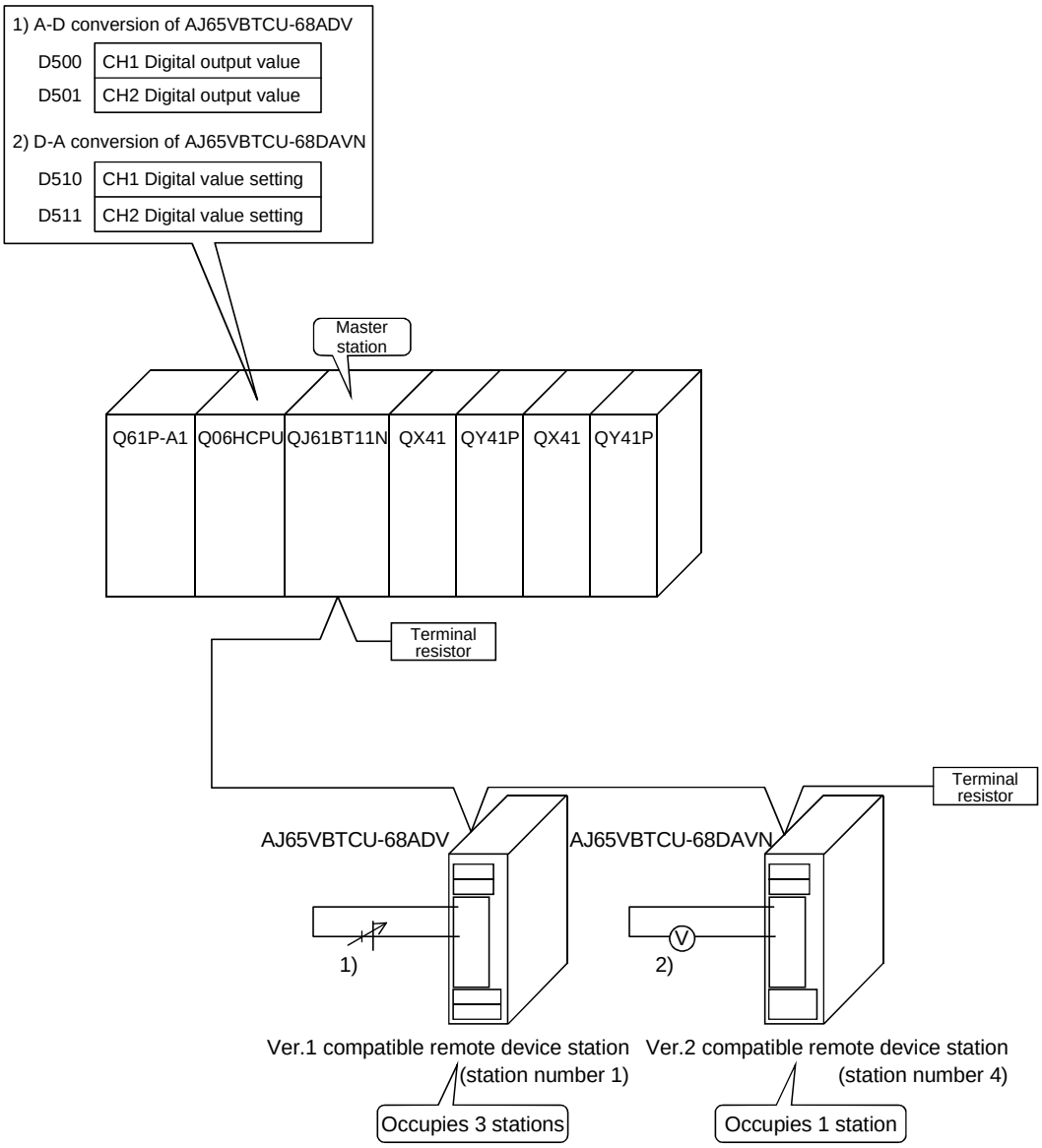


10 - 56

### (2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

1) Change the voltage input to the AJ65VBTCU-68ADV and confirm that the A-D converted digital value also changes.
2) Set digital values to the AJ65VBTCU-68DAVN, and confirm that the voltages converted from digital to analog are output.





10 - 57

# 11 COMMUNICATION BETWEEN THE MASTER STATION AND LOCAL STATIONS

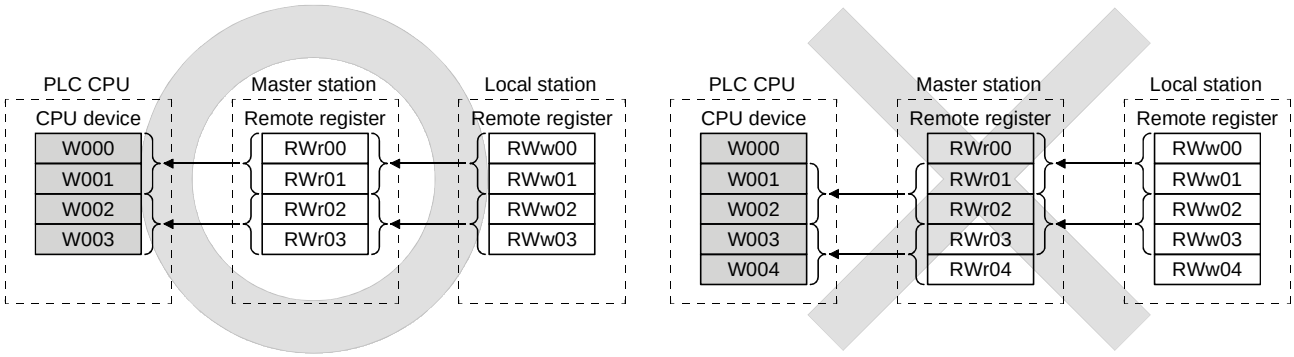


This chapter explains the procedures from module settings to parameter settings, programming, and finally operation check using a system configuration example.

## 11.1 Secured 32-bit Data

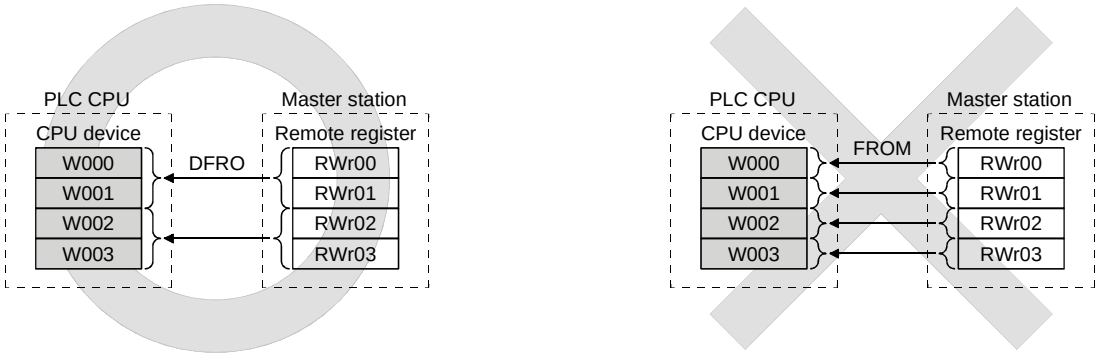
When the following conditions, 1) and 2) are satisfied in the CC-Link network, 32-bit data in remote registers (RWr/RWw) between a PLC CPU and a master/local station can be secured.

1) Access starts from a remote resister (RWr/RWw) address of an "even number".




* Because the start address on the remote resister side is an "odd address", new and old data may be mixed in 16-bit (1-word) units.

2) Access by the sequence program must be made in units of even points.




* Because the access is made for each single point (1-word), new and old data may be mixed in 16-bit (1-word) units.

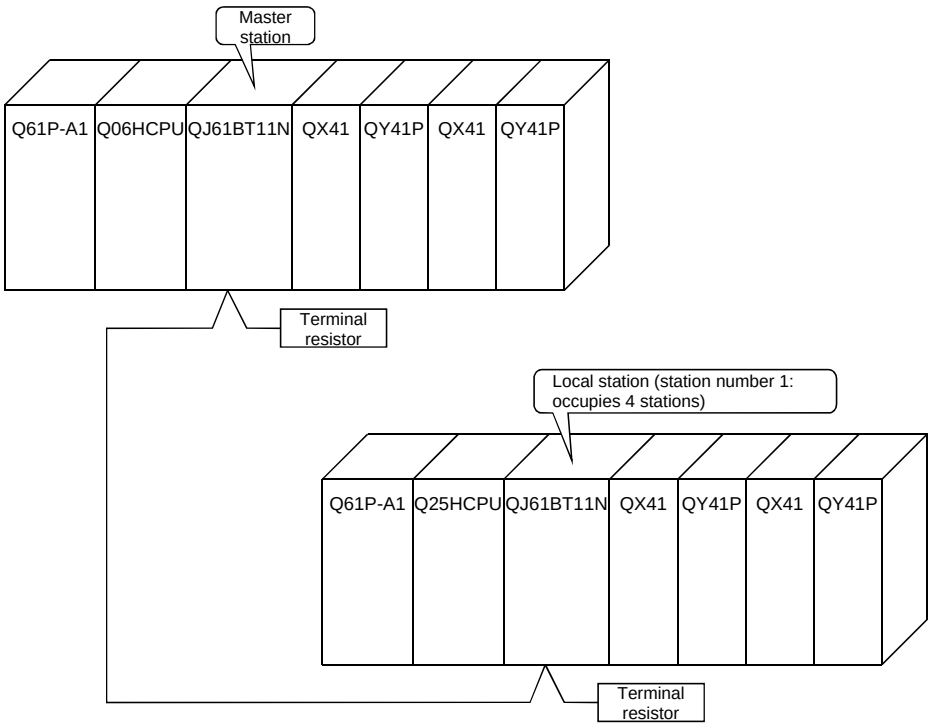

11 - 1

## 11.2 When Remote Net Ver.1 Mode is Used



### 11.2.1 Configuring a system

As shown below, a system with one connected local station is used as an example.

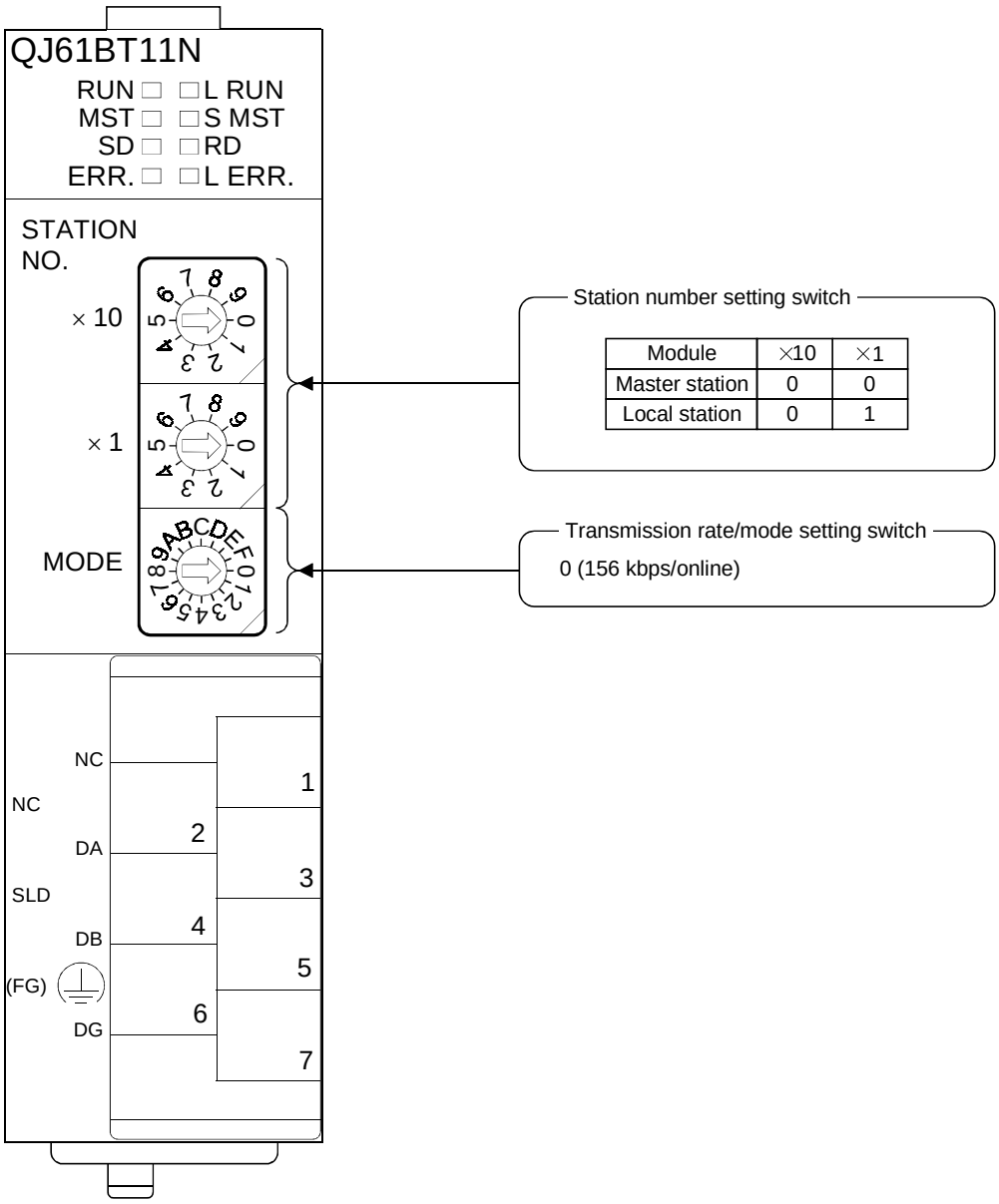





11 - 2

(1) Setting the master and local stations

Settings of the master station switches are shown below:






11 - 3

## 11.2.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

### (1) Setting the network parameters of the master station

#### (a) Setting the network parameters

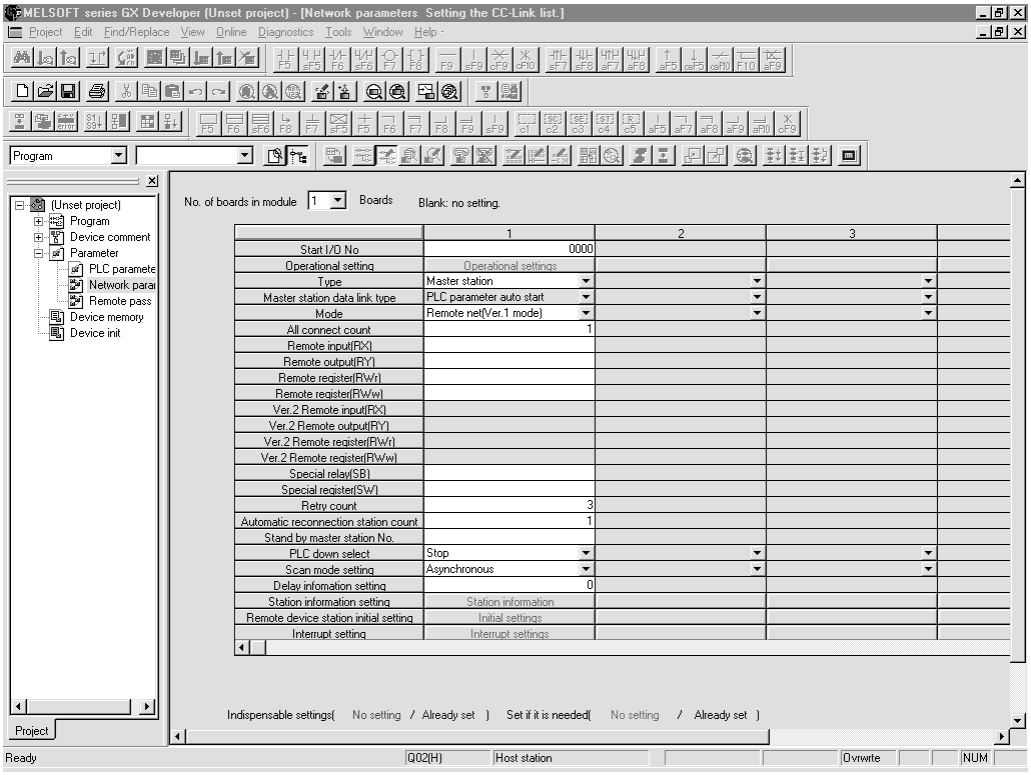
Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | (Mater station)<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | (Remote net (Ver.1 mode))<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | 1 modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | 3 times |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | 1 modules |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | (Stop)/continue |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | (Asynchronous)/synchronous |
| Delay information setting | | Set 0. | |

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 1 | Intelligent device station | single | Occupies 4 stations | 128 points | No setting | 64 | 64 | 128 |
| | | | | | | | | |
| | | | | | | | | |

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W100.

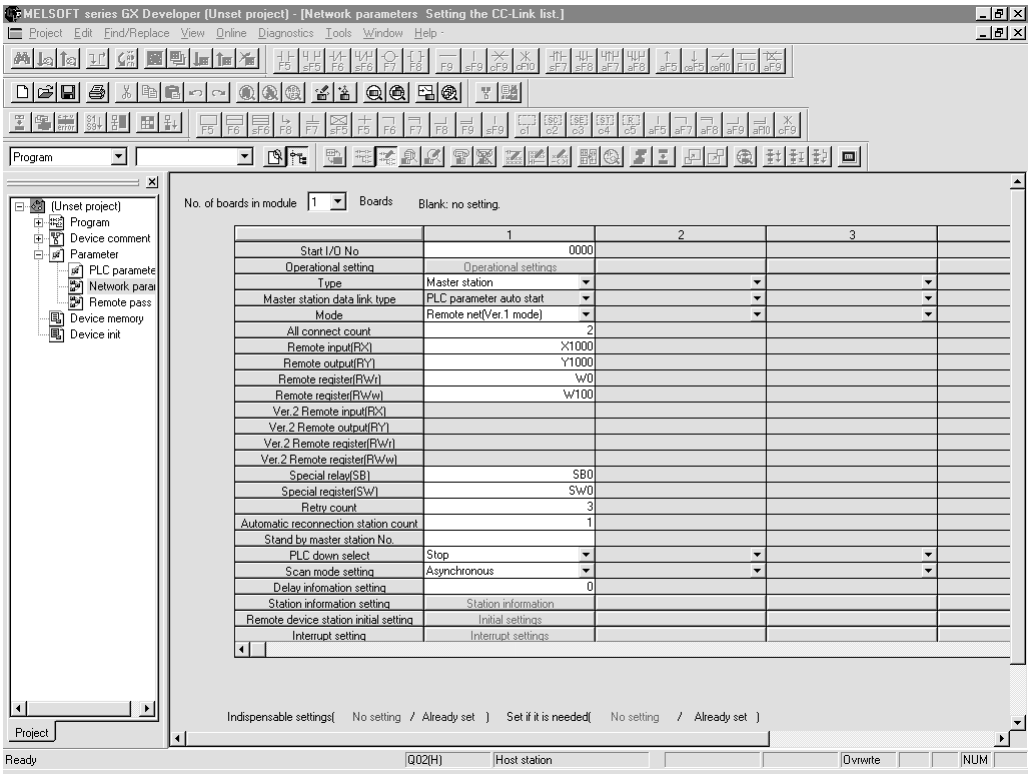
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

A setting example is shown below.



## 11.2.3 Setting the local station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the local station.

### (1) Setting the network parameters of the local station

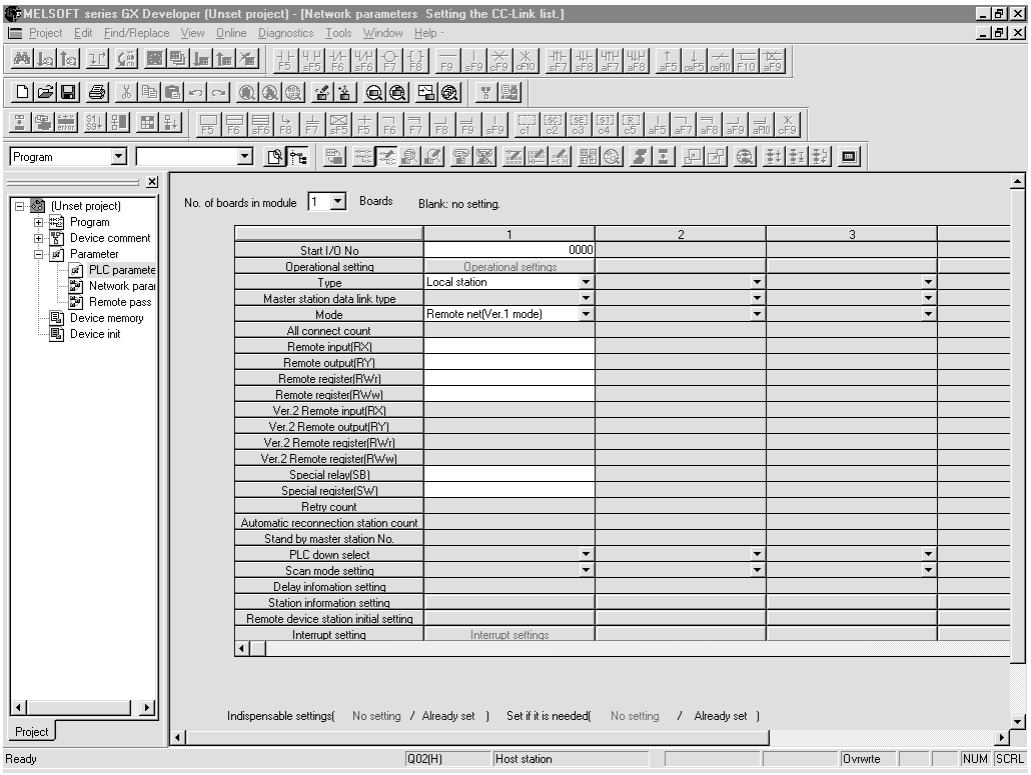
#### (a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Clear: Refresh | (Refresh)/Clears compulsorily |
| | Number of occupied stations | Occupies 1 to 4 stations<br>Default: Occupies 1 station | Occupies 4 stations |
| | Expanded cyclic setting | single/double/quadruple/octuple<br>Default: single | |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | Master station<br>Master station (Duplex function)<br>(Local station)<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | (Remote net (Ver.1 mode))<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | ~~modules~~ |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | ~~times~~ |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | ~~modules~~ |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | ~~Stop/continue~~ |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | ~~Asynchronous~~/synchronous |
| Delay information setting | | Set 0. | |

### (b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the local station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W100.

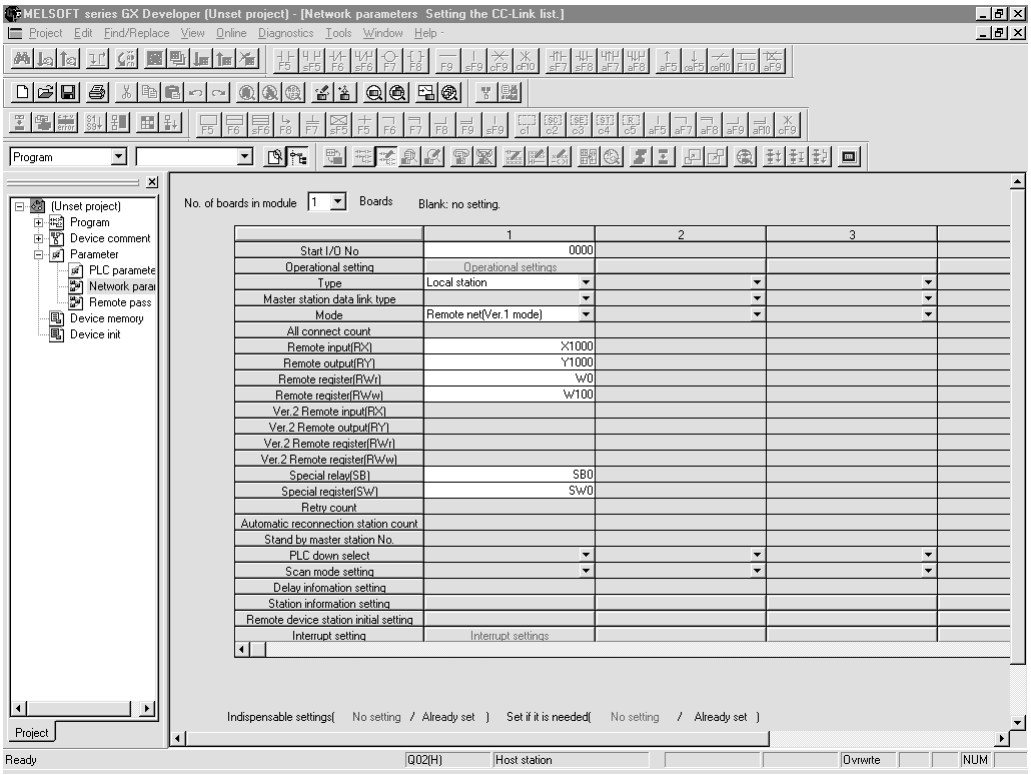
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

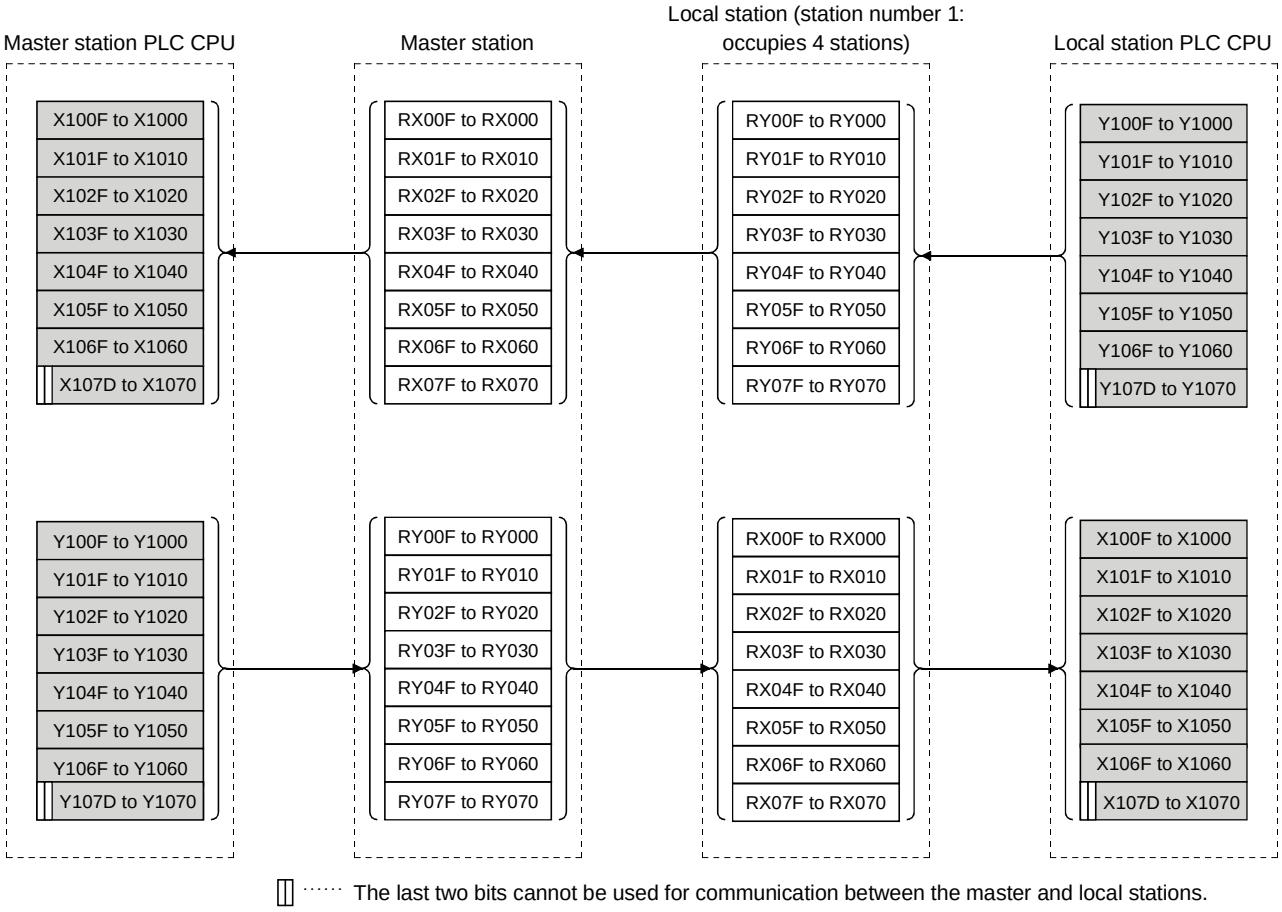
A setting example is shown below.



## 11.2.4 Creating a program

This section shows the program to be used for communication between the master and local stations. The following diagram shows the relationship between the devices of the master station PLC CPU and the devices of the local station PLC CPU.
The shaded areas indicate the devices that are actually used.

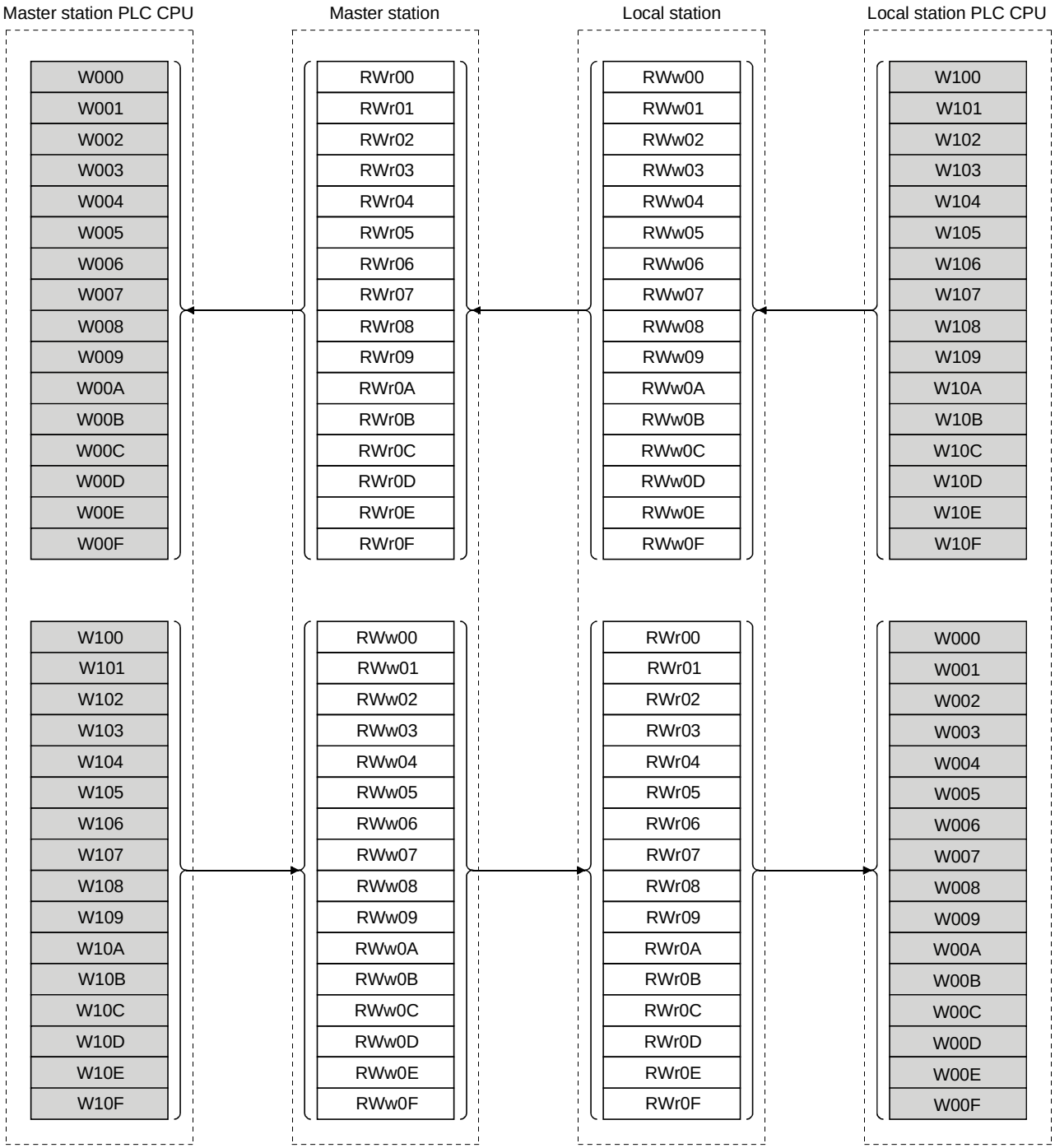
[Remote input (RX) and remote output (RY)]




▯ ····· The last two bits cannot be used for communication between the master and local stations.


11 - 10

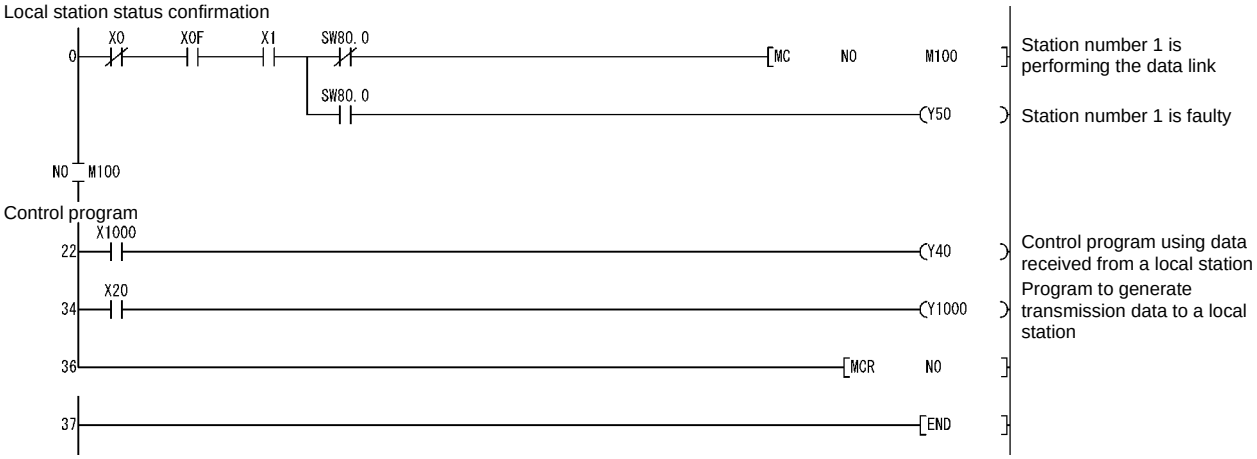
[Remote registers (RWw and RWr)]



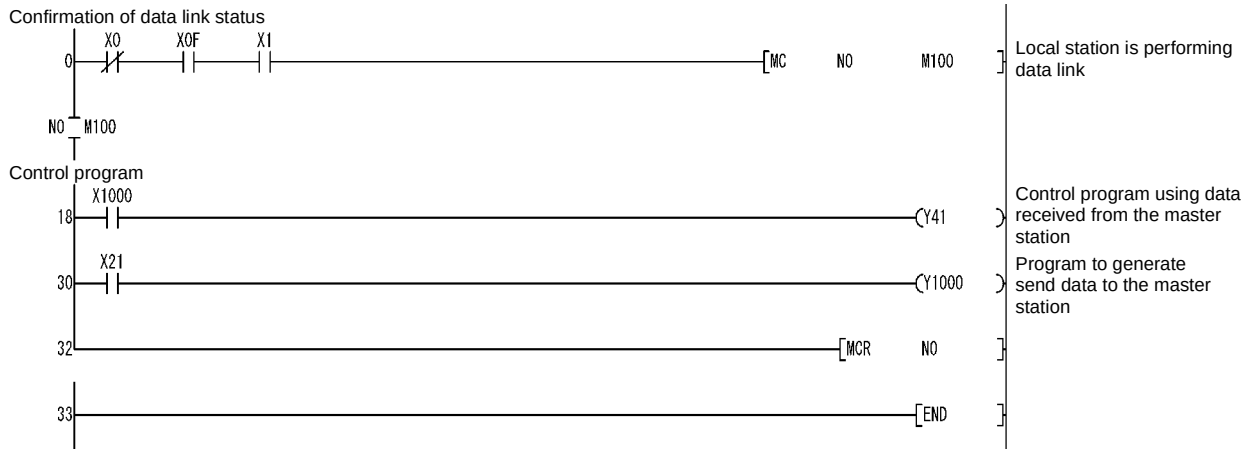



11 - 11

### (1) Master station program




### (2) Local station program



REMARK

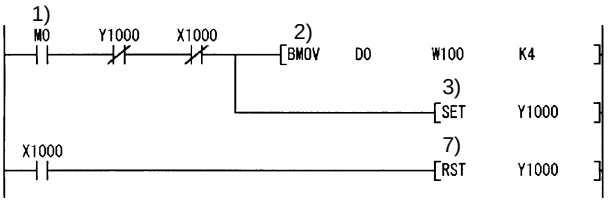
Securing cyclic data on a per-station basis

By configuring an interlock with remote I/O (RX/RY), cyclic data can be secured on a per-station (4-word) basis.*1

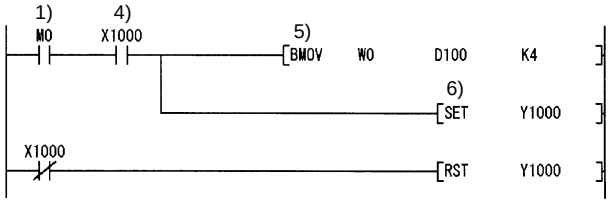
*1 Data of more than one station are not secured.

Configure an interlock with remote I/O (RX/RY) as shown in the following example.

Sending station (master station)




Receiving station (local station)




1) The send/receive command (M0) turns ON.
2) Data of D0 to D3 are stored in W100 to W103 (RWw0 to RWw3).
3) Upon completion of storage in W100 to W103, Y1000 (RY0) for handshake turns ON.
4) By cyclic transmission, remote output (RY) data are sent following the remote resister (RWw) data, and the receiving station's X1000 (RX0) turns ON.
5) Data of W0 to W3 (RWr0 to RWr3) are stored in D100 to D103.
6) Upon completion of storage in D100 to D103, Y1000 (RY0) for handshake turns ON.
7) When the data transmission to the receiving station is complete, Y1000 turns OFF.

## 11.2.5 Performing the data link

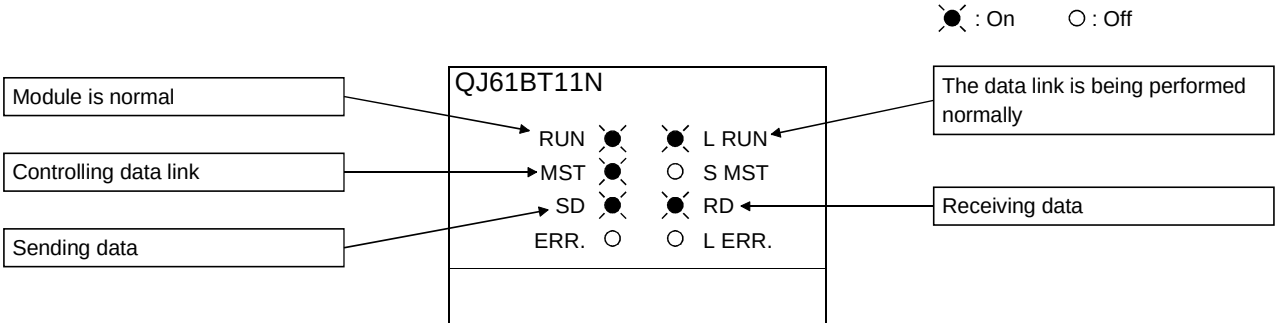
Turn on the power to the local station first, and then turn on the power to the master station to start the data link.

### (1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the local station when the data link is being performed normally.

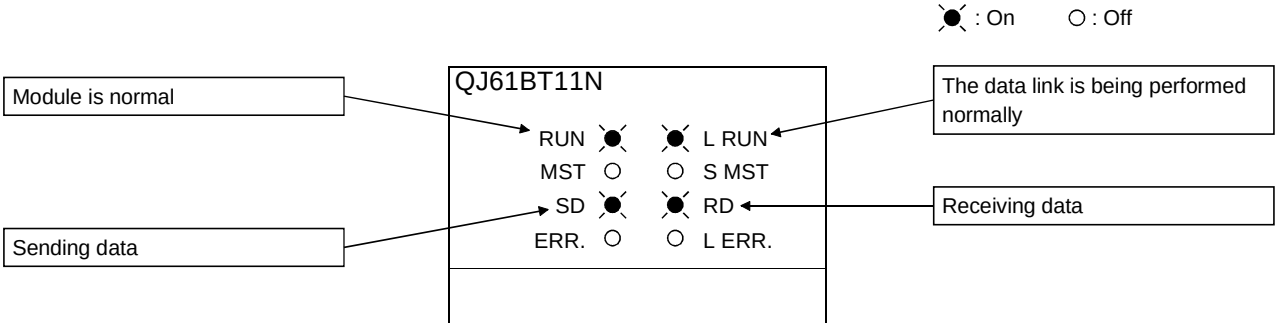
#### (a) LED display of the master station

Make sure that the LED display shows the following status:




#### (b) LED display of the local station

Make sure that the LED display shows the following status:



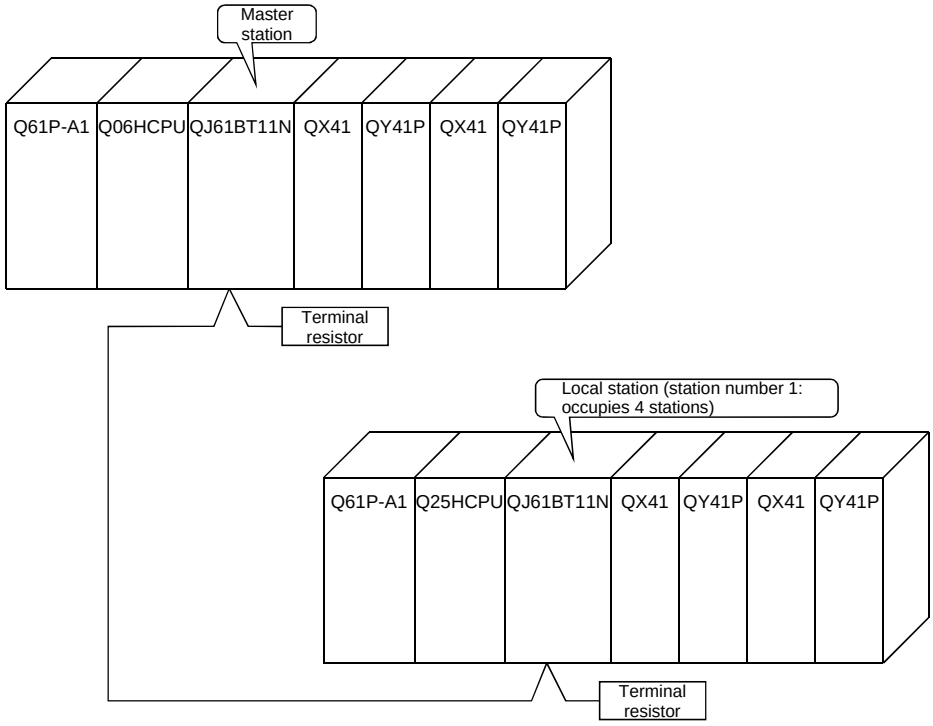


11 - 14

### (2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

1) When X20 of the master station is turned on, Y41 of the local station turns on.
2) When X21 of the local station is turned on, Y40 of the master station turns on.



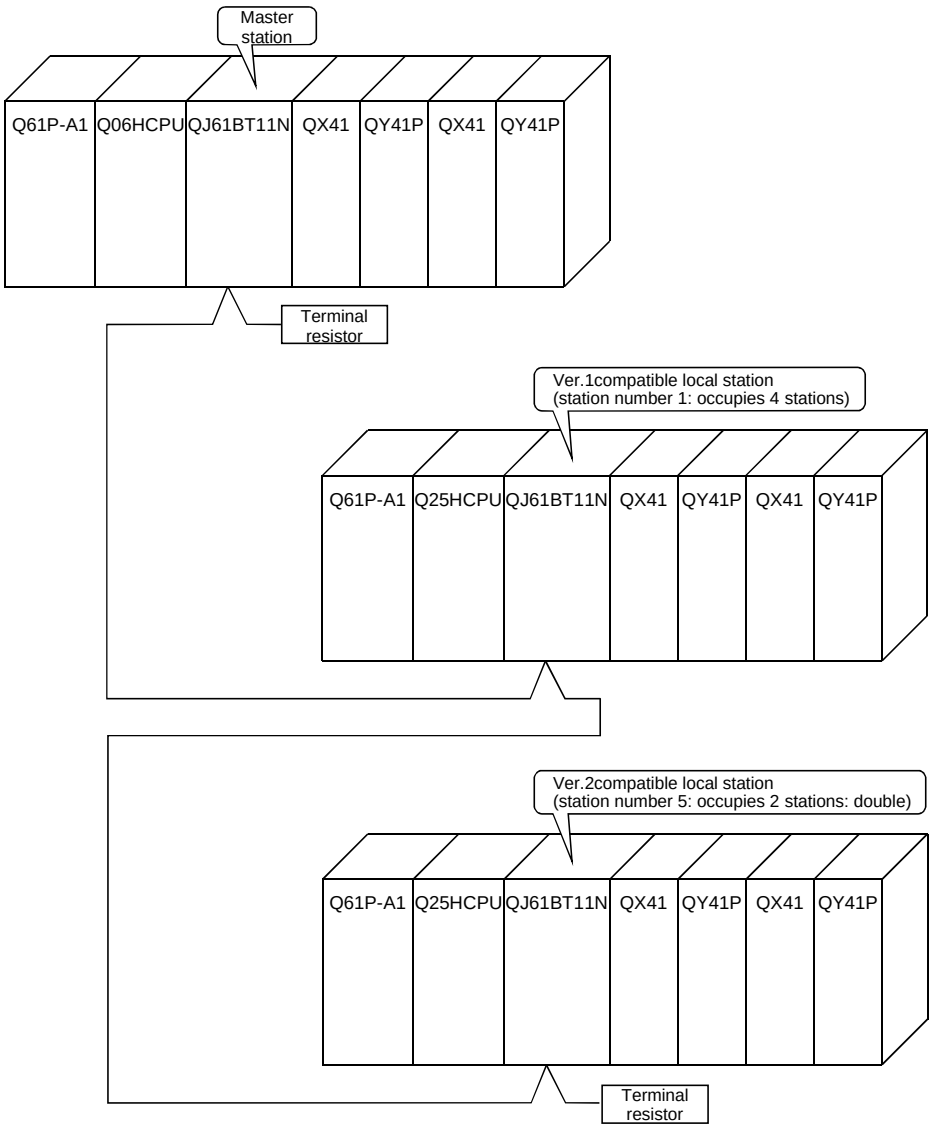


11 - 15

## 11.3 When Remote Net Ver.2 Mode is Used

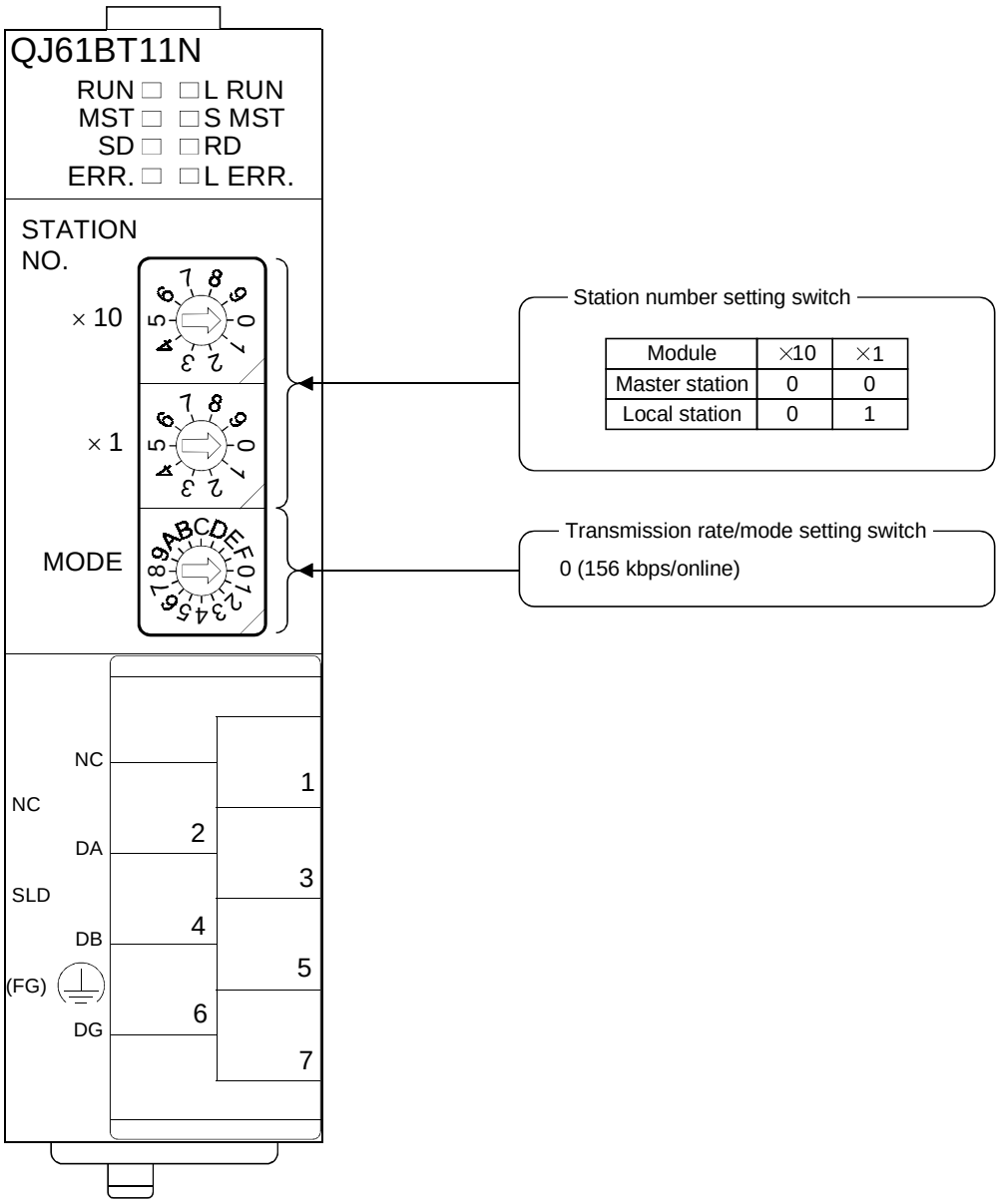
### 11.3.1 Configuring a system

As shown below, a system with two connected local station is used as an example.



(1) Setting the master and local stations

Settings of the master station switches are shown below:






11 - 17

## 11.3.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

### (1) Setting the network parameters of the master station

#### (a) Setting the network parameters

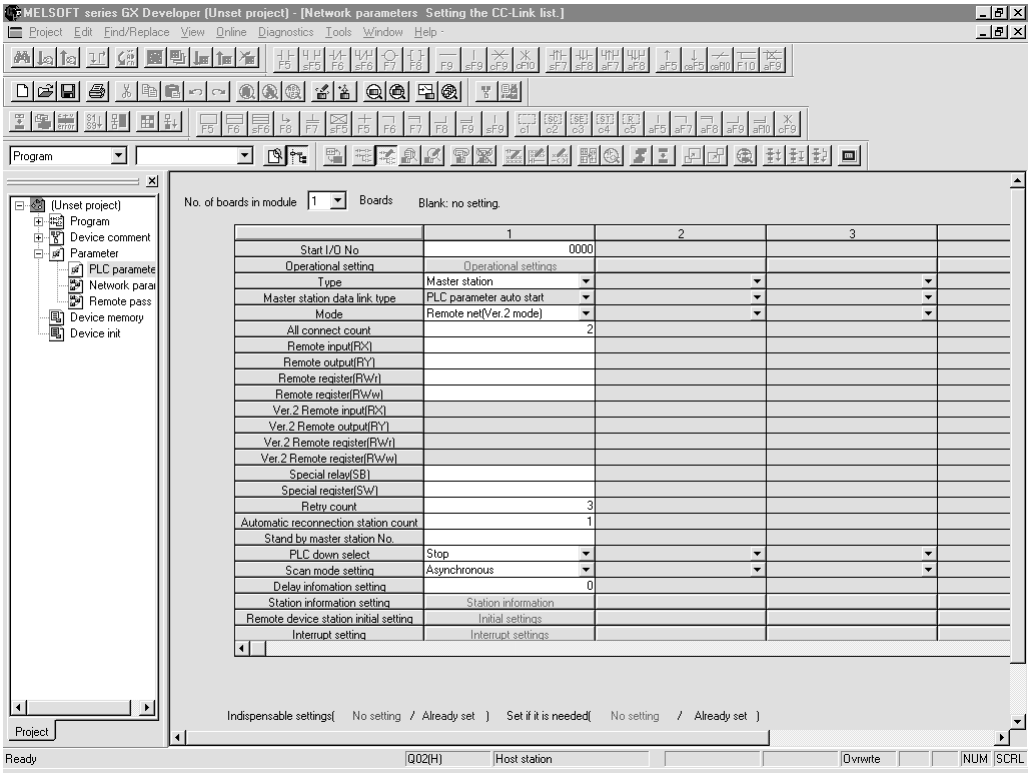
Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | (Mater station)<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>(Remote net (Ver.2 mode))<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | 2 modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | 3 times |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | 1 modules |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | (Stop)/continue |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | (Asynchronous)/synchronous |
| Delay information setting | | Set 0. | |

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 1 | Ver.1Intelligent device station | single | Occupies 4 stations | 128 points | No setting | 64 | 64 | 128 |
| | | | | | | | | |
| 5 | Ver.2Intelligent device station | double | Occupies 2 stations | 96 points | No setting | 64 | 64 | 128 |
| | | | | | | | | |

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W1000.

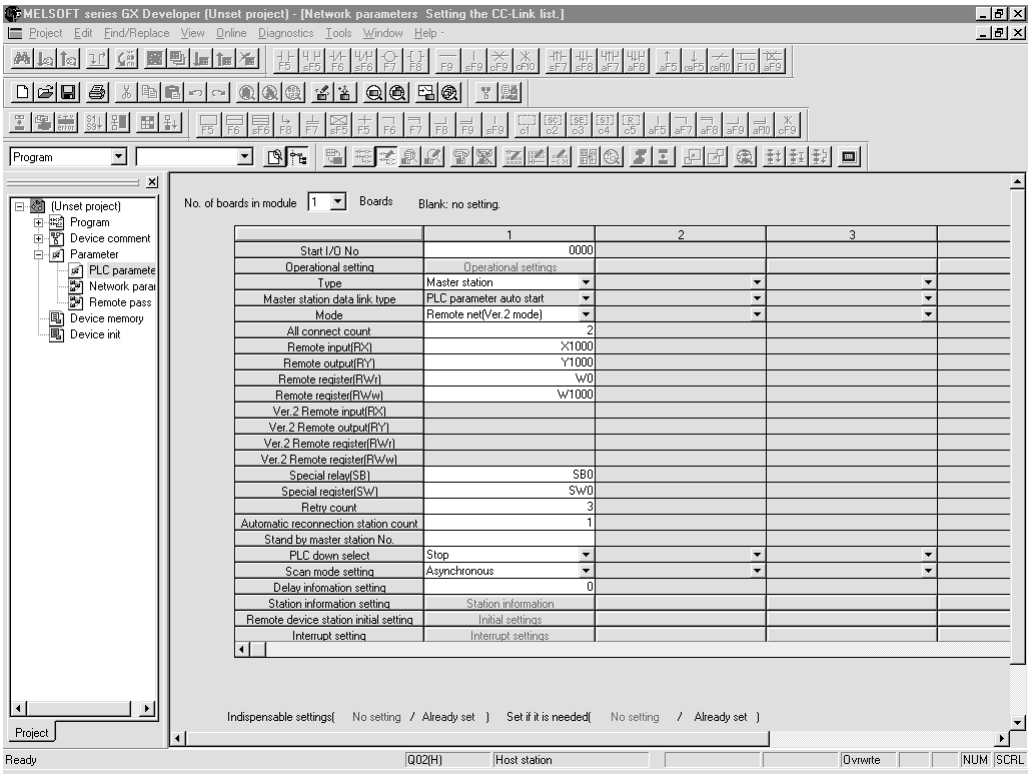
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

A setting example is shown below.



## 11.3.3 Setting the local station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the local station.

### (1) Setting the network parameters of the ver.1 compatible local station (station number 1)

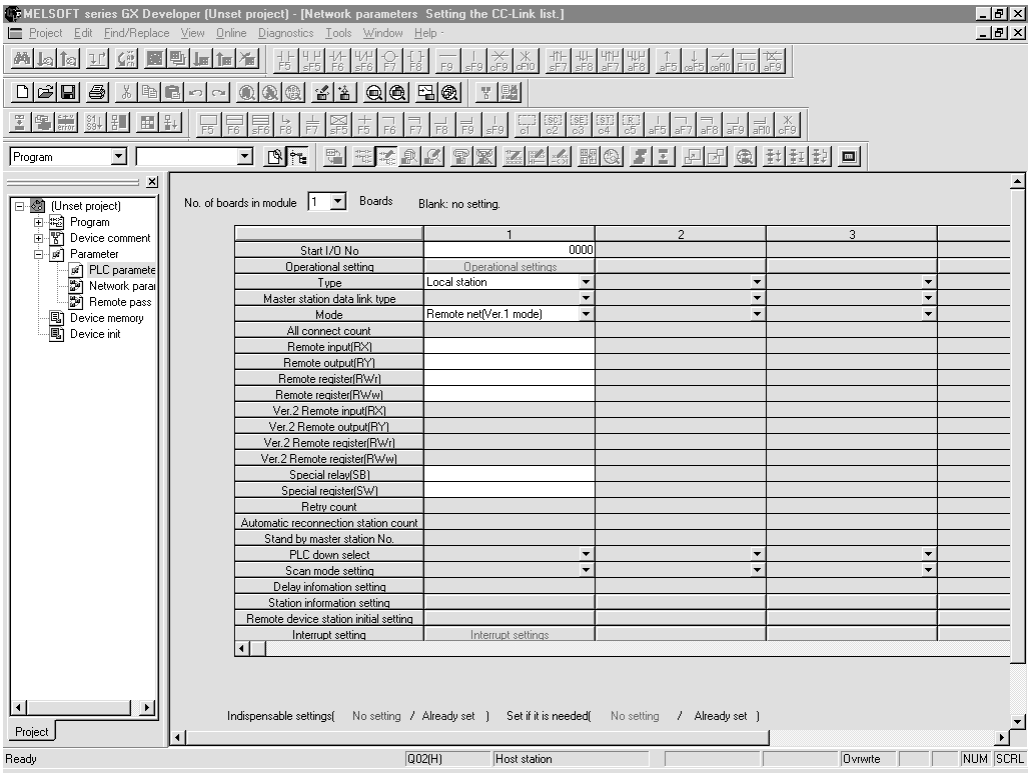
#### (a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Clear: Refresh | (Refresh)/Clears compulsorily |
| | Number of occupied stations | Occupies 1 to 4 stations<br>Default: Occupies 1 station | Occupies 4 stations |
| | Expanded cyclic setting | single/double/quadruple/octuple<br>Default: single | |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | Master station<br>Master station (Duplex function)<br>(Local station)<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | (Remote net (Ver.1 mode))<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | ~~modules~~ |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | ~~times~~ |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | ~~modules~~ |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | ~~Stop/continue~~ |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | ~~Asynchronous~~/synchronous |
| Delay information setting | | Set 0. | |

### (b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W1000.

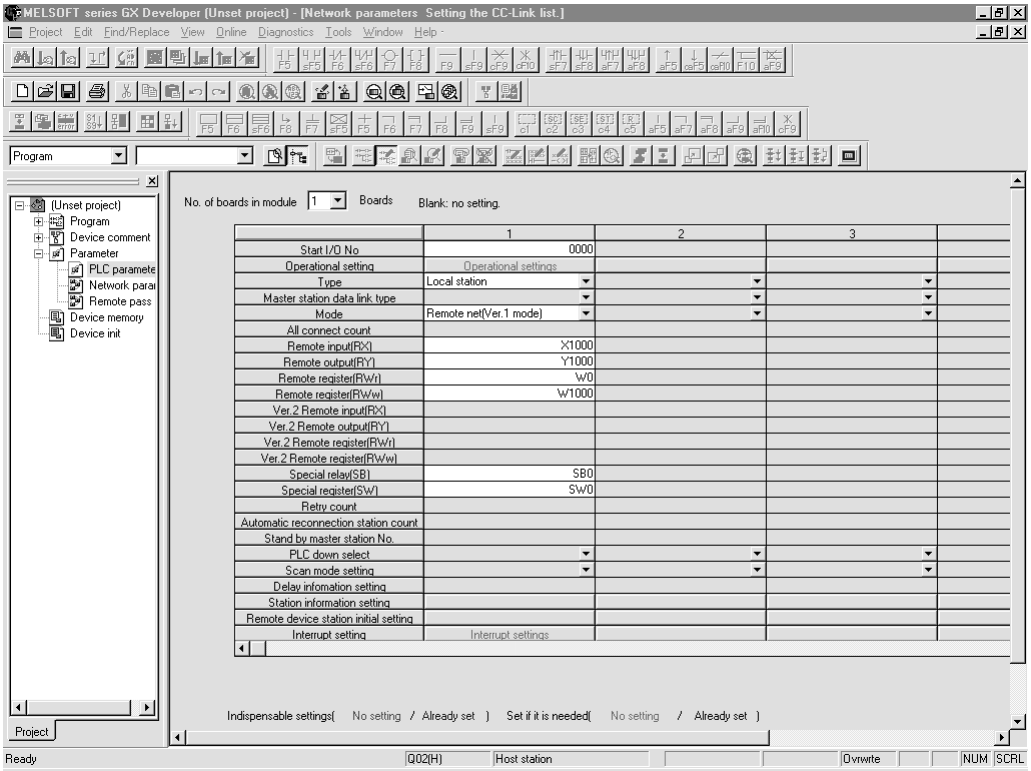
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

A setting example is shown below.



(3) Setting the network parameters of the ver.2 compatible local station (station number 5)

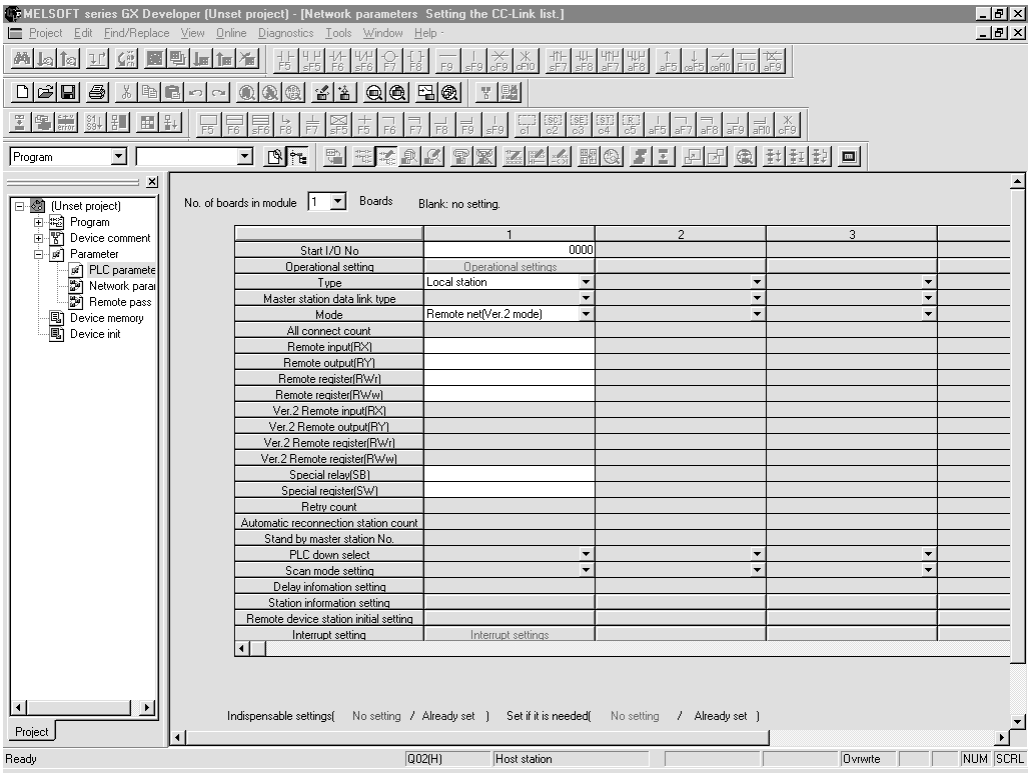
(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| | Number of occupied stations | Occupies 1 to 4 stations<br>Default: Occupies 1 station | Occupies 2 stations |
| | Expanded cyclic setting | single/double/quadruple/octuple<br>Default: single | double |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | Master station<br>Master station (Duplex function)<br>(Local station)<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>(Remote net (Ver.2 mode))<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | ~~modules~~ |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | ~~times~~ |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | ~~modules~~ |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | ~~Stop/continue~~ |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | ~~Asynchronous/synchronous~~ |
| Delay information setting | | Set 0. | |

### (b) Example of network parameter settings

An example of network parameter settings is shown below:



(4) Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W1000.

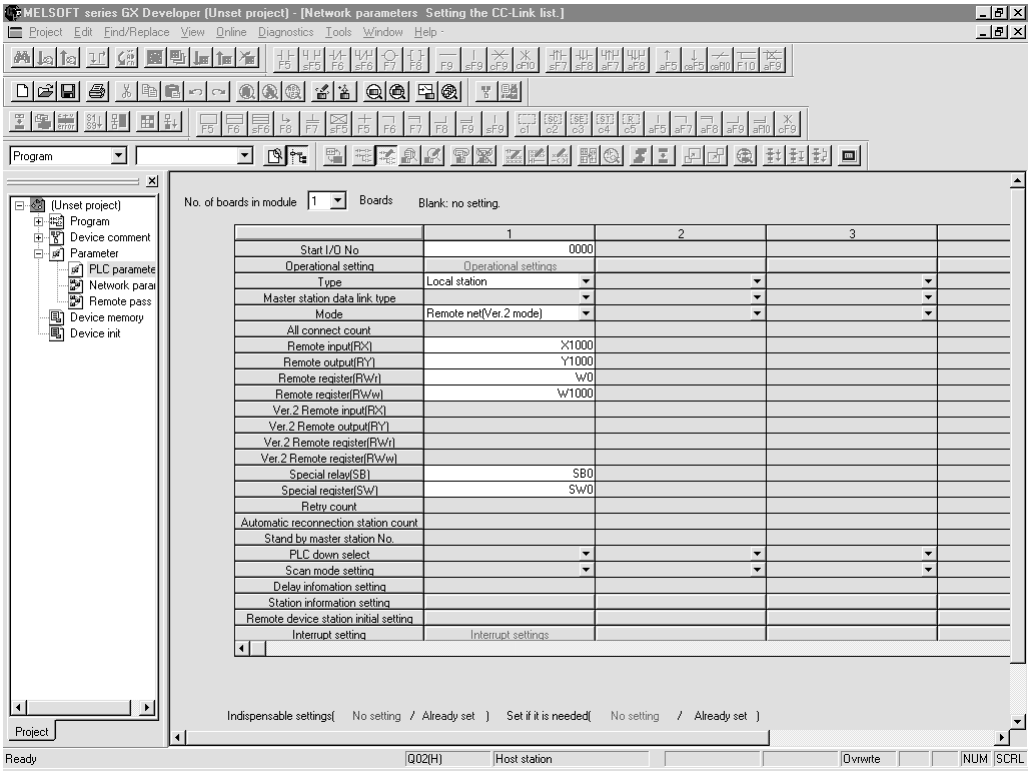
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

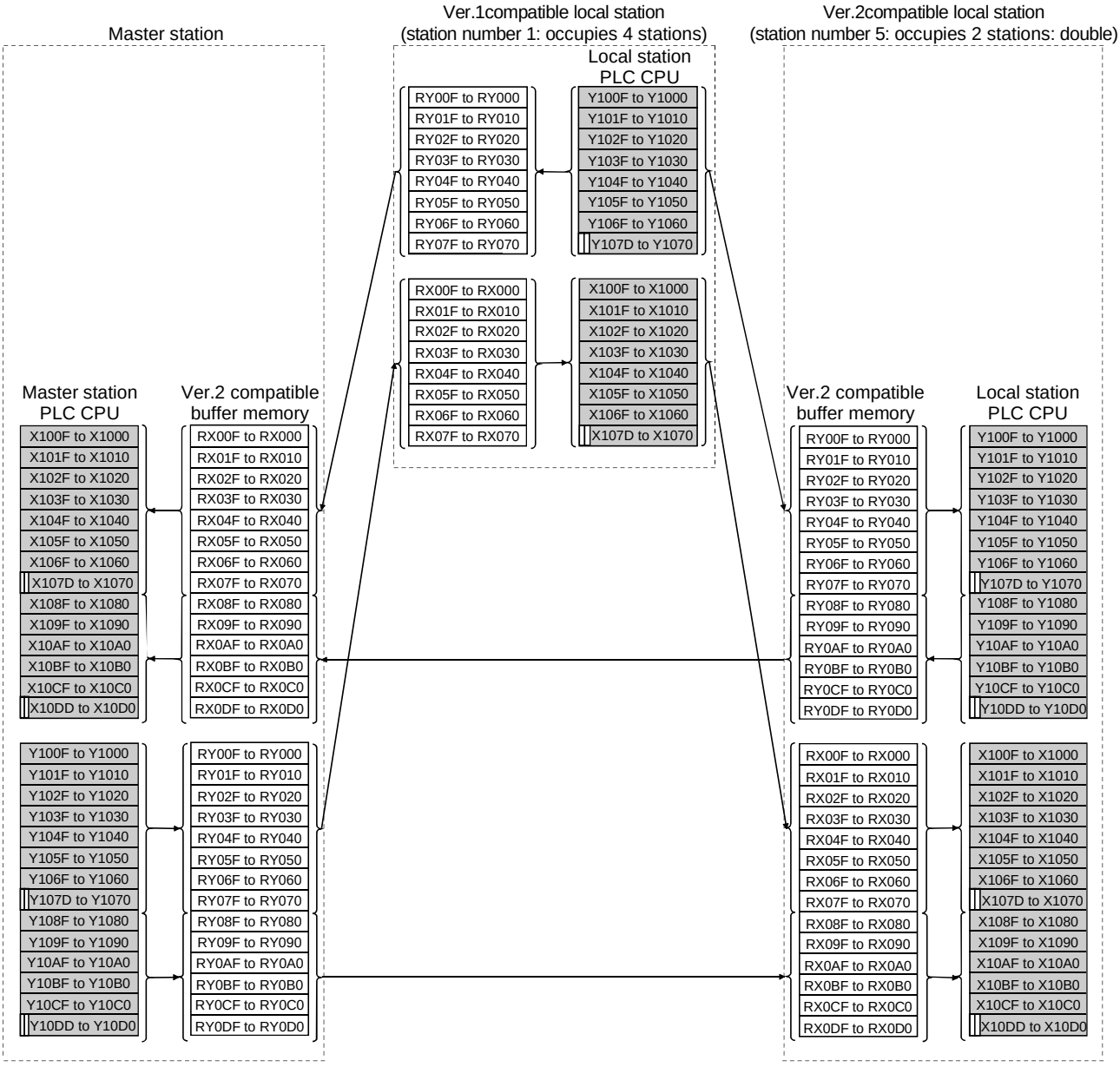
A setting example is shown below.



## 11.3.4 Creating a program

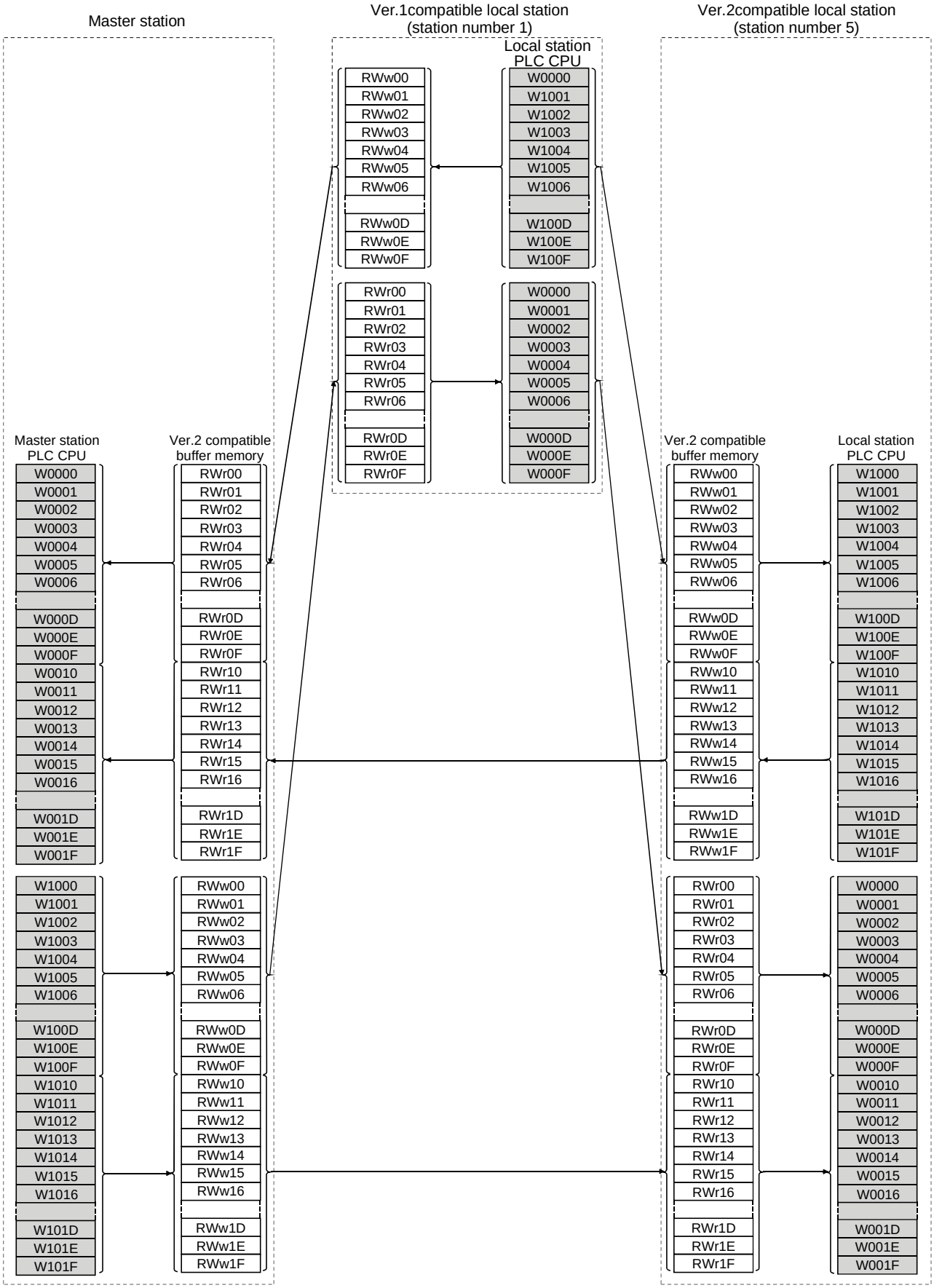
This section shows the program to be used for communication between the master and local stations. The following diagram shows the relationship between the devices of the master station PLC CPU and the devices of the local station PLC CPU.
The shaded areas indicate the devices that are actually used.

[Remote input (RX) and remote output (RY)]




[]····· The last two bits cannot be used for communication between the master and local stations.

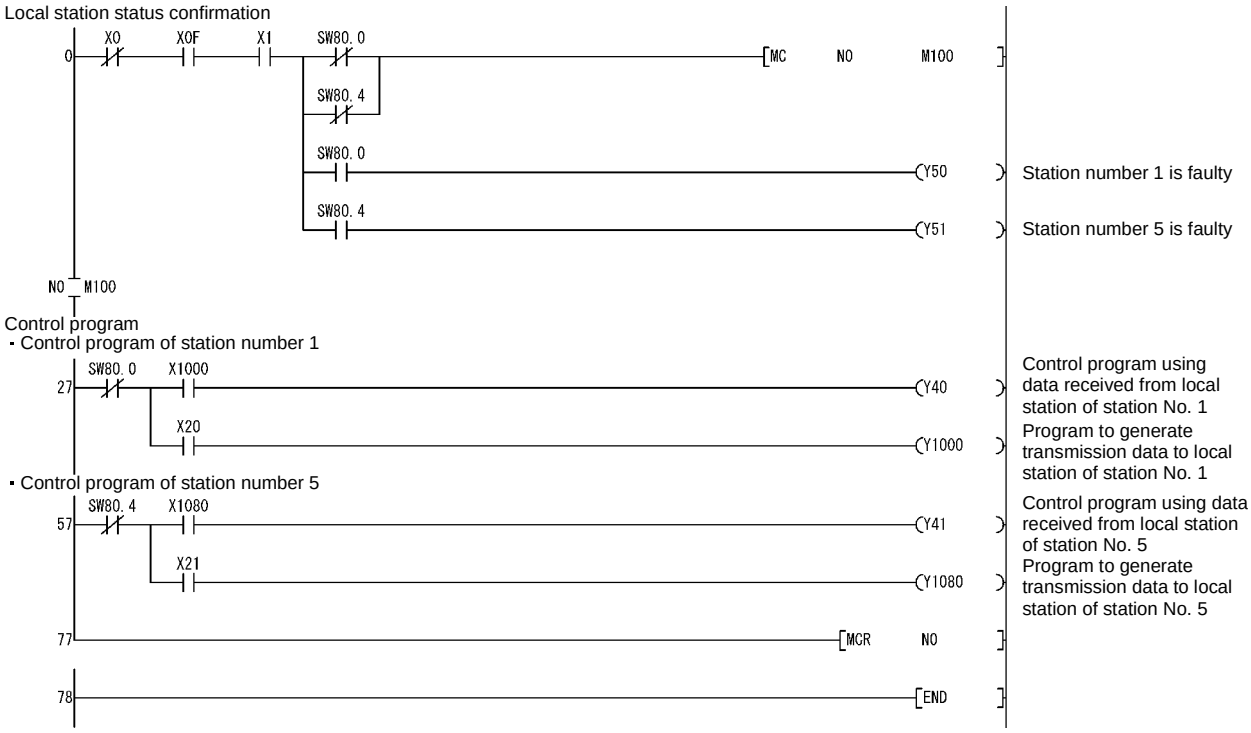
## [Remote registers (RWw and RWr)]


Master station
Ver.1compatible local station (station number 1)
Ver.2compatible local station (station number 5)
Local station PLC CPU
RWw00 RWw01 RWw02 RWw03 RWw04 RWw05 RWw06 RWw0D RWw0E RWw0F
W0000 W1001 W1002 W1003 W1004 W1005 W1006 W100D W100E W100F
RWr00 RWr01 RWr02 RWr03 RWr04 RWr05 RWr06 RWr0D RWr0E RWr0F
W0000 W0001 W0002 W0003 W0004 W0005 W0006 W000D W000E W000F
Master station PLC CPU
Ver.2 compatible buffer memory
Ver.2 compatible buffer memory
Local station PLC CPU
W0000 W0001 W0002 W0003 W0004 W0005 W0006 W000D W000E W000F W0010 W0011 W0012 W0013 W0014 W0015 W0016 W001D W001E W001F
RWr00 RWr01 RWr02 RWr03 RWr04 RWr05 RWr06 RWr0D RWr0E RWr0F RWr10 RWr11 RWr12 RWr13 RWr14 RWr15 RWr16 RWr1D RWr1E RWr1F
RWw00 RWw01 RWw02 RWw03 RWw04 RWw05 RWw06 RWw0D RWw0E RWw0F RWw10 RWw11 RWw12 RWw13 RWw14 RWw15 RWw16 RWw1D RWw1E RWw1F
W1000 W1001 W1002 W1003 W1004 W1005 W1006 W100D W100E W100F W1010 W1011 W1012 W1013 W1014 W1015 W1016 W101D W101E W101F
W1000 W1001 W1002 W1003 W1004 W1005 W1006 W100D W100E W100F W1010 W1011 W1012 W1013 W1014 W1015 W1016 W101D W101E W101F
RWw00 RWw01 RWw02 RWw03 RWw04 RWw05 RWw06 RWw0D RWw0E RWw0F RWw10 RWw11 RWw12 RWw13 RWw14 RWw15 RWw16 RWw1D RWw1E RWw1F
RWr00 RWr01 RWr02 RWr03 RWr04 RWr05 RWr06 RWr0D RWr0E RWr0F RWr10 RWr11 RWr12 RWr13 RWr14 RWr15 RWr16 RWr1D RWr1E RWr1F
W0000 W0001 W0002 W0003 W0004 W0005 W0006 W000D W000E W000F W0010 W0011 W0012 W0013 W0014 W0015 W0016 W001D W001E W001F



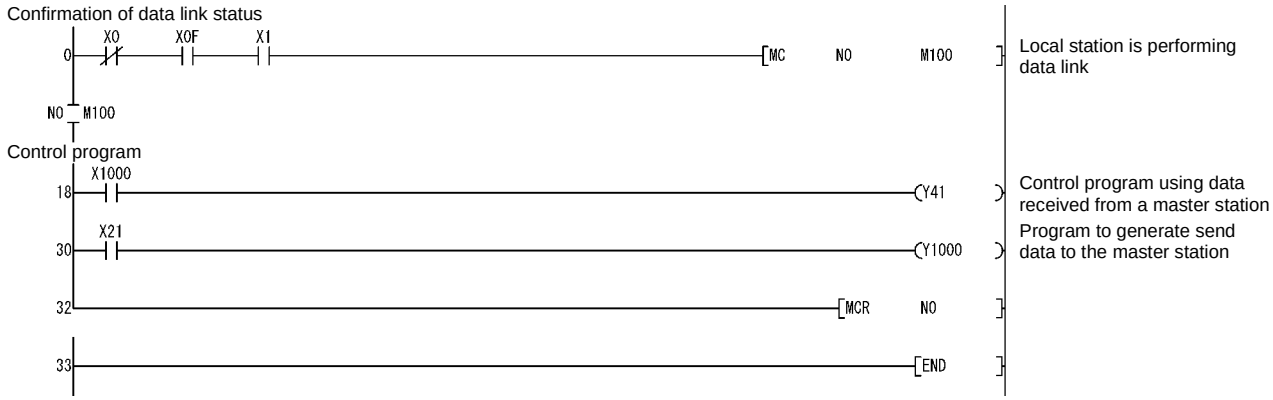
11 - 28

### (1) Master station program

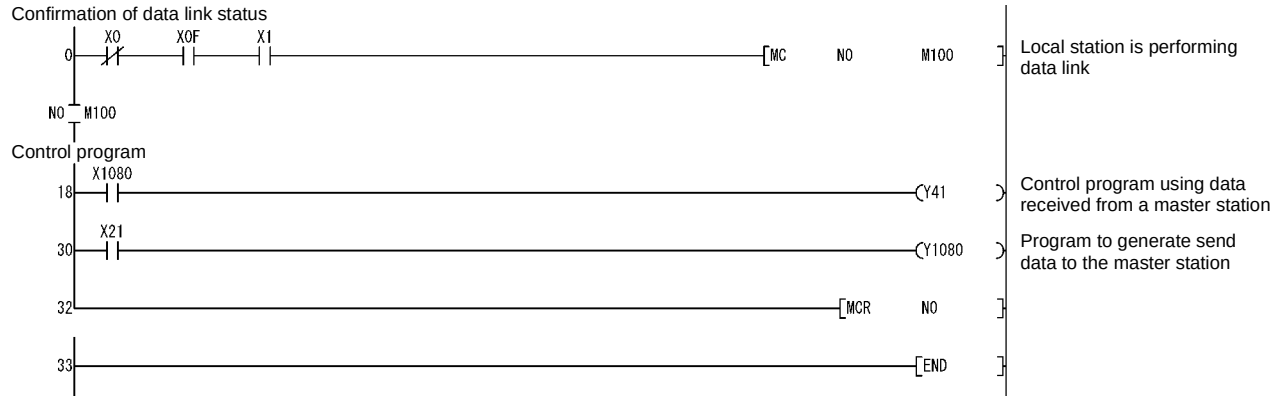



### (2) Local station program

#### (a) Ver.1 compatible local station (station number 1) program




#### (b) Ver.2 compatible local station (station number 5) program



REMARK

By configuring an interlock with remote I/O (RX/RY), cyclic data can be secured on a per-station (4-word) basis.
For details, refer to Remark in Section 11.2.4.

## 11.3.5 Performing the data link

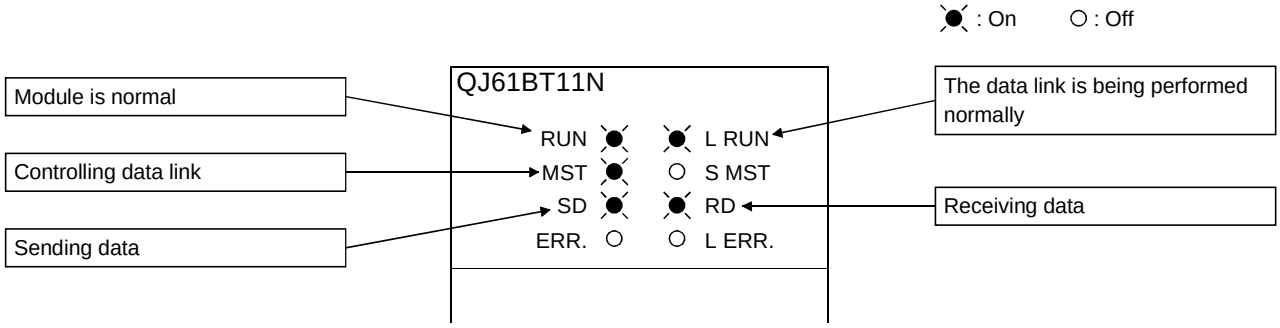
Turn on the power to the local station first, and then turn on the power to the master station to start the data link.

### (1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the local station when the data link is being performed normally.

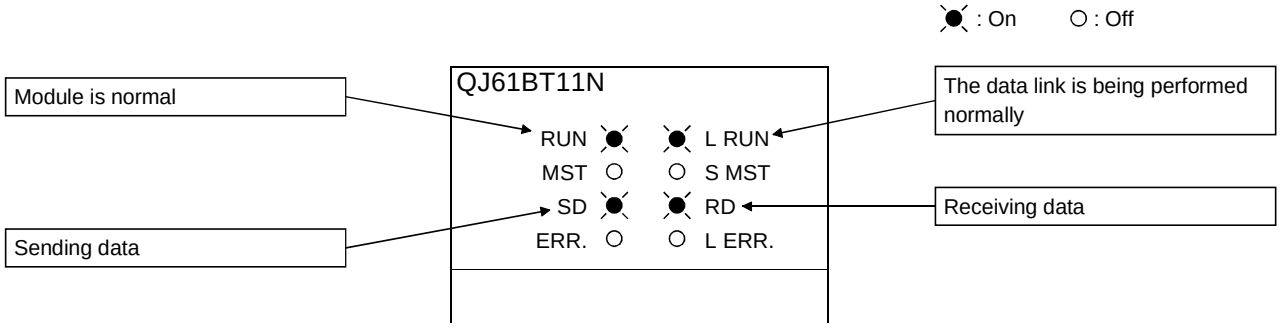
#### (a) LED display of the master station

Make sure that the LED display shows the following status:




#### (b) LED display of the local station

Make sure that the LED display shows the following status:



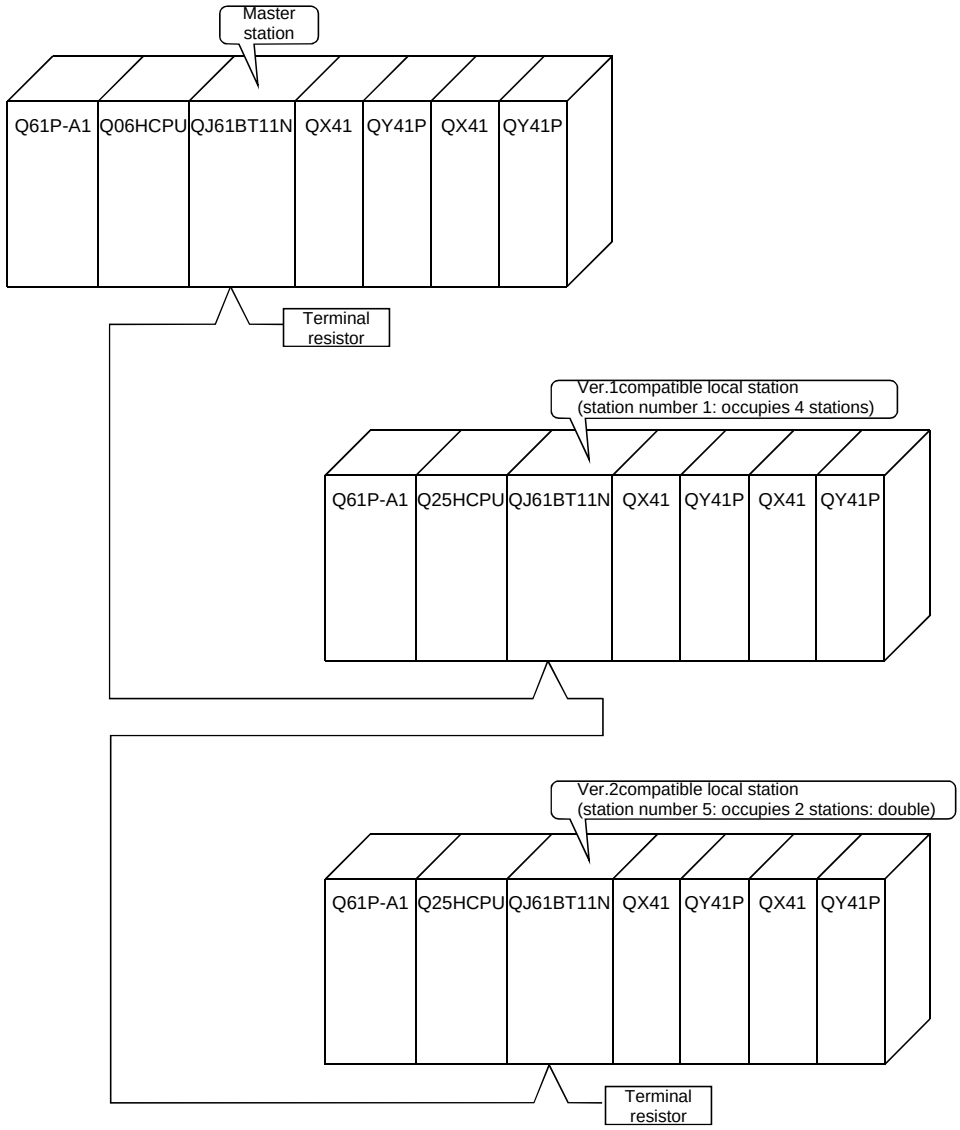


11 - 30

### (2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

1) When X20 of the master station is turned on, Y41 of the local station of station No. 1 turns on.
2) When X21 of the local station of station No. 1 is turned on, Y40 of the master station turns on.
3) When X21 of the master station is turned on, Y41 of the local station of station No. 5 turns on.
4) When X21 of the local station of station No. 5 is turned on, Y41 of the master station turns on.



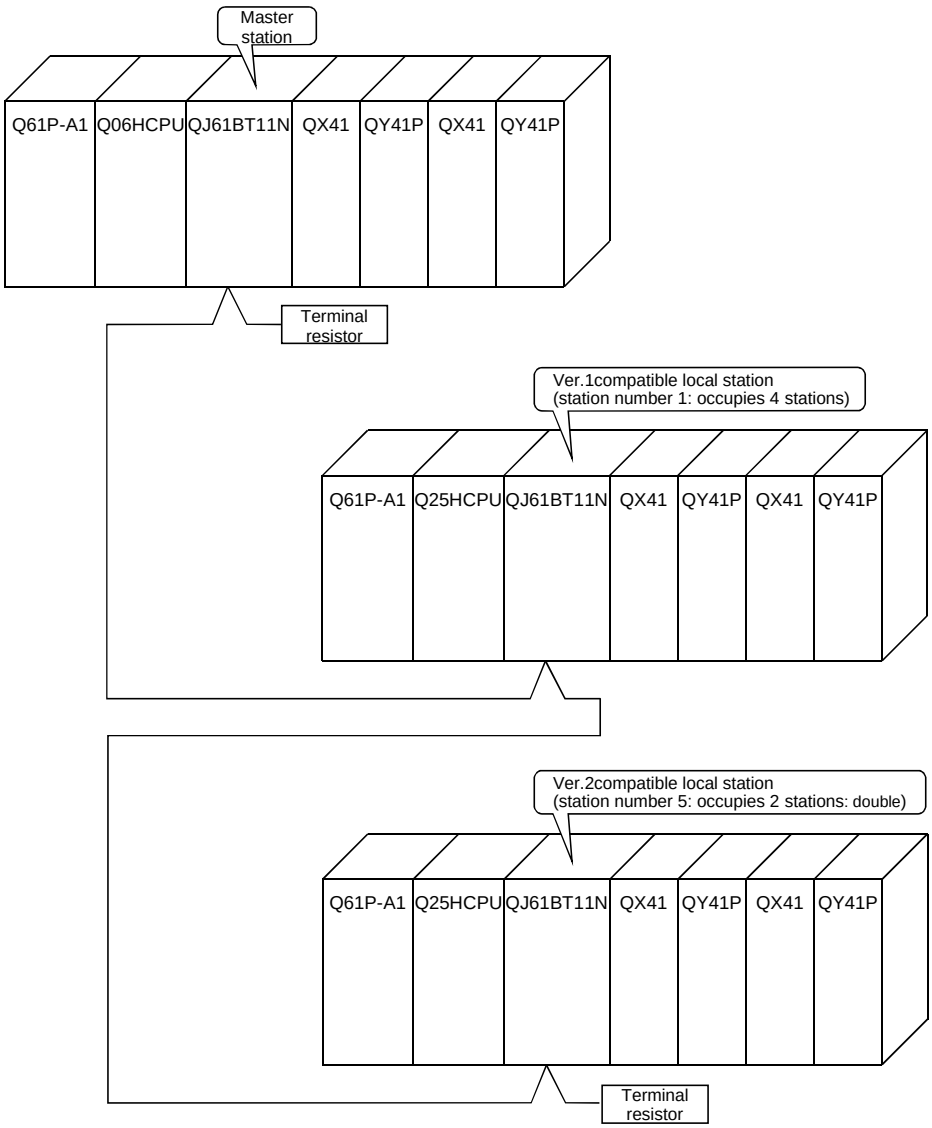


11 - 31

## 11.4 When Remote Net Additional Mode is Used

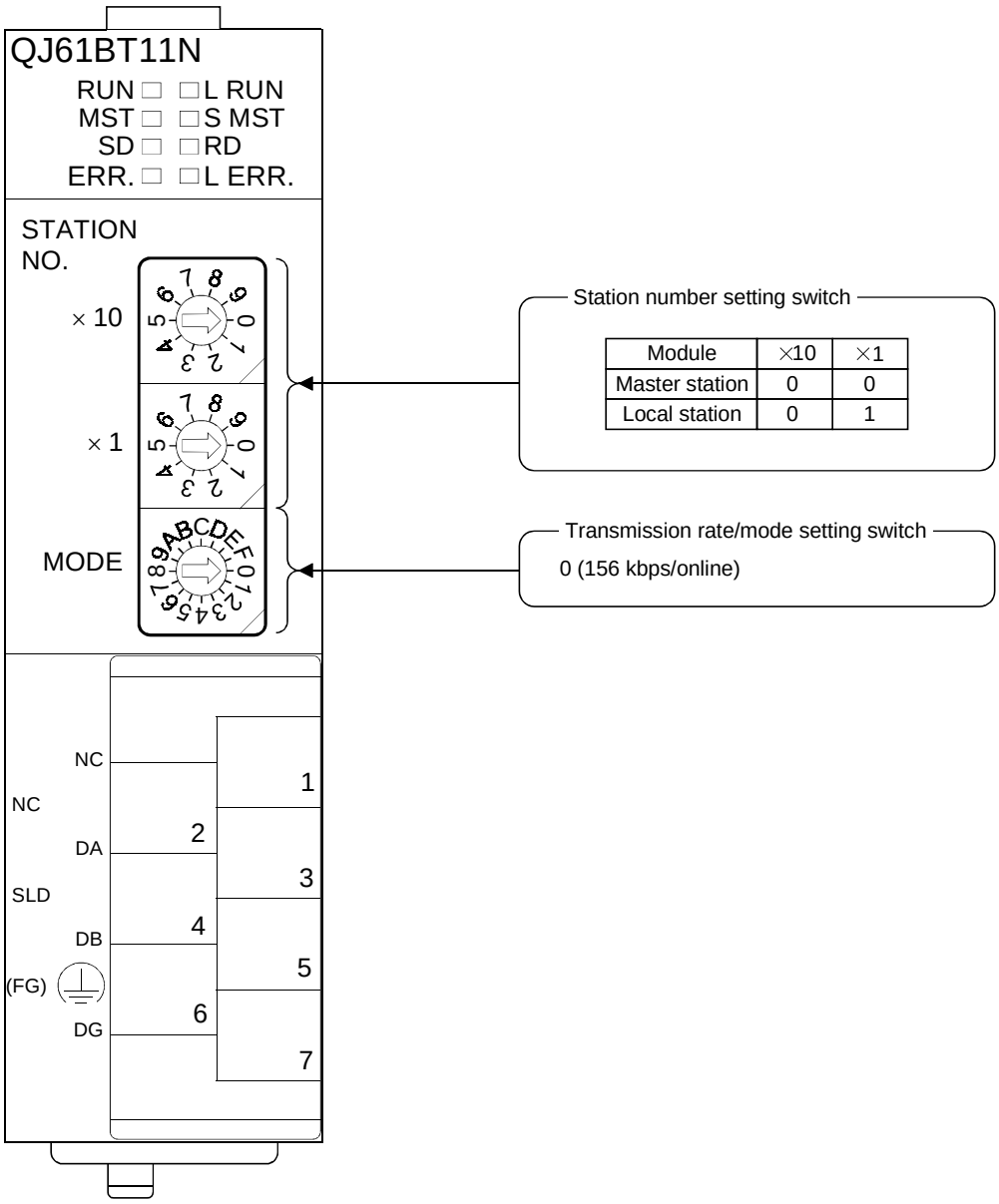
### 11.4.1 Configuring a system

As shown below, a system with two connected local station is used as an example.



(1) Setting the master and local stations

Settings of the master station switches are shown below:






11 - 33

## 11.4.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

### (1) Setting the network parameters of the master station

#### (a) Setting the network parameters

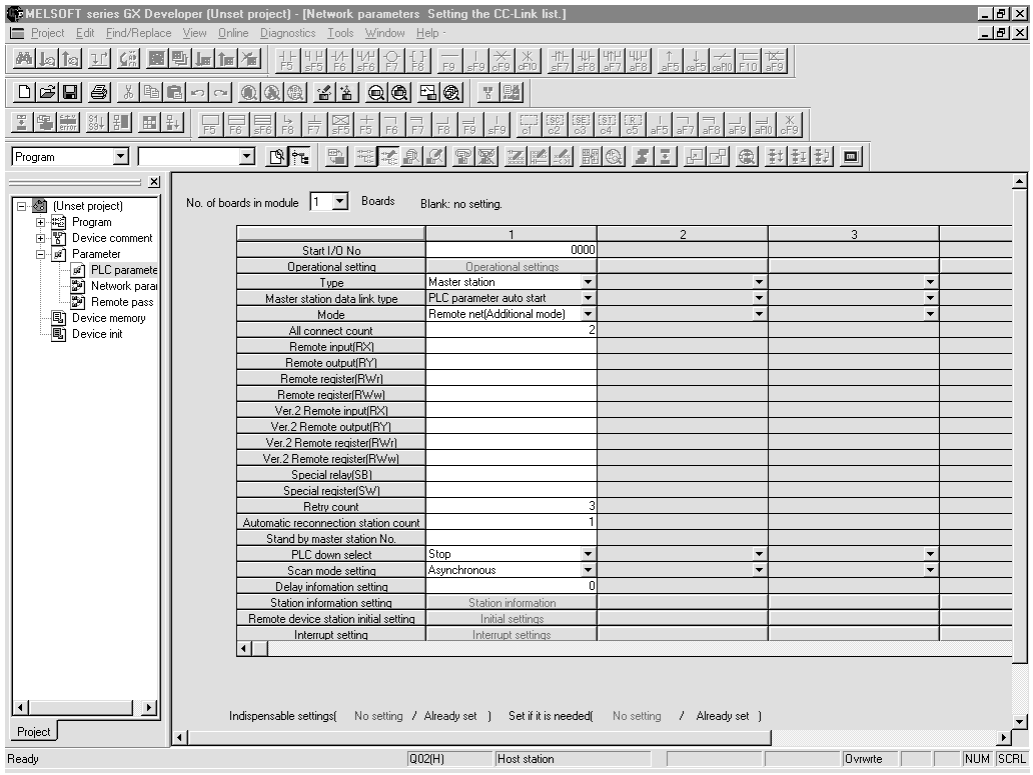
Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | (Mater station)<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>(Remote net (Additional mode))<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | 2 modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | 3 times |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | 1 modules |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | (Stop)/continue |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | (Asynchronous)/synchronous |
| Delay information setting | | Set 0. | |

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 1 | Ver.1Intelligent device station | single | Occupies 4 stations | 128 points | No setting | 64 | 64 | 128 |
| | | | | | | | | |
| 5 | Ver.2Intelligent device station | double | Occupies 2 stations | 96 points | No setting | 64 | 64 | 128 |
| | | | | | | | | |

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W100.

5) Set the refresh device for ver.2 remote input (RX) to X1500.

6) Set the refresh device for ver.2 remote output (RY) to Y1500.

7) Set the refresh device for ver.2 remote register (RWr) to W1000.

8) Set the refresh device for ver.2 remote register (RWw) to W1500.

9) Set the refresh device for special relay (SB) to SB0.

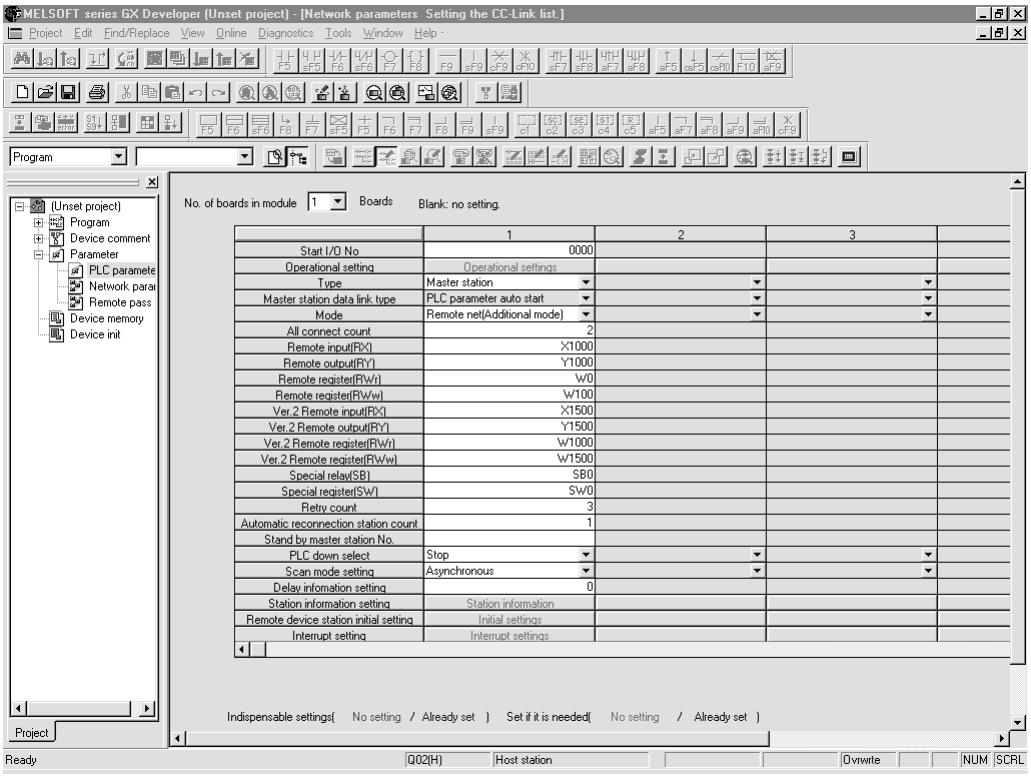
10) Set the refresh device for special register (SW) to SW0.

**POINT**

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



## 11.4.3 Setting the local station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the local station.

### (1) Setting the network parameters of the ver.1 compatible local station (station number 1)

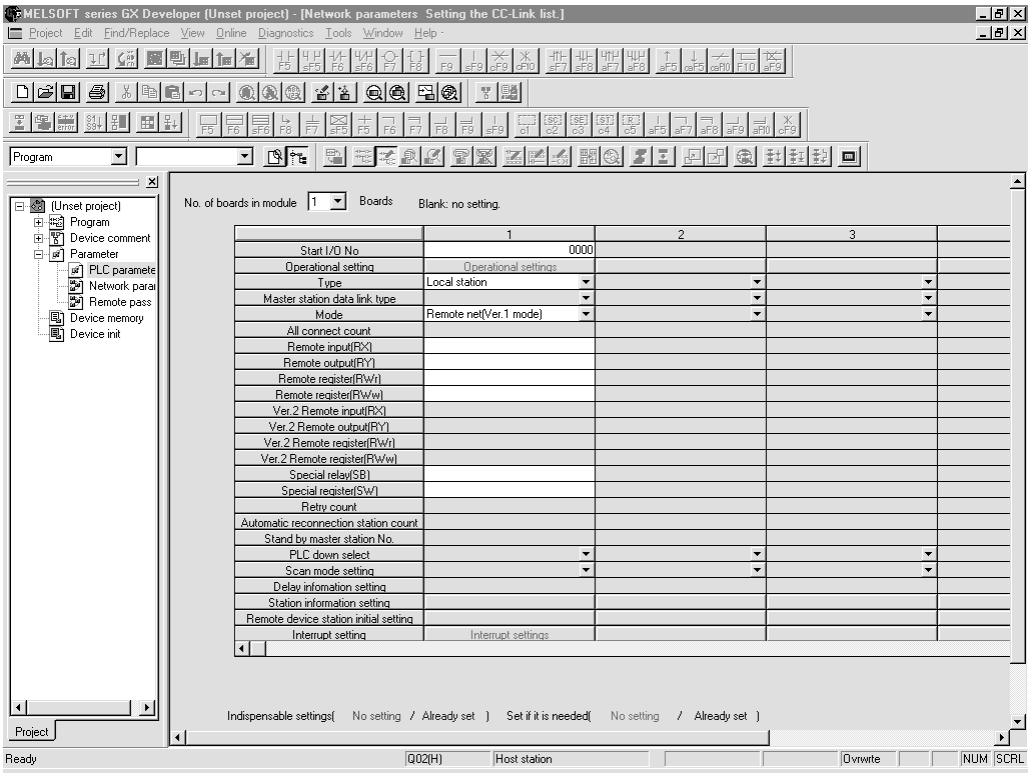
#### (a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Clear: Refresh | (Refresh)/Clears compulsorily |
| | Number of occupied stations | Occupies 1 to 4 stations<br>Default: Occupies 1 station | Occupies 4 stations |
| | Expanded cyclic setting | single/double/quadruple/octuple<br>Default: single | |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | Master station<br>Master station (Duplex function)<br>(Local station)<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | (Remote net (Ver.1 mode))<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | ~~modules~~ |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | ~~times~~ |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | ~~modules~~ |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | ~~Stop/continue~~ |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | ~~Asynchronous~~/synchronous |
| Delay information setting | | Set 0. | |

### (b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W100.

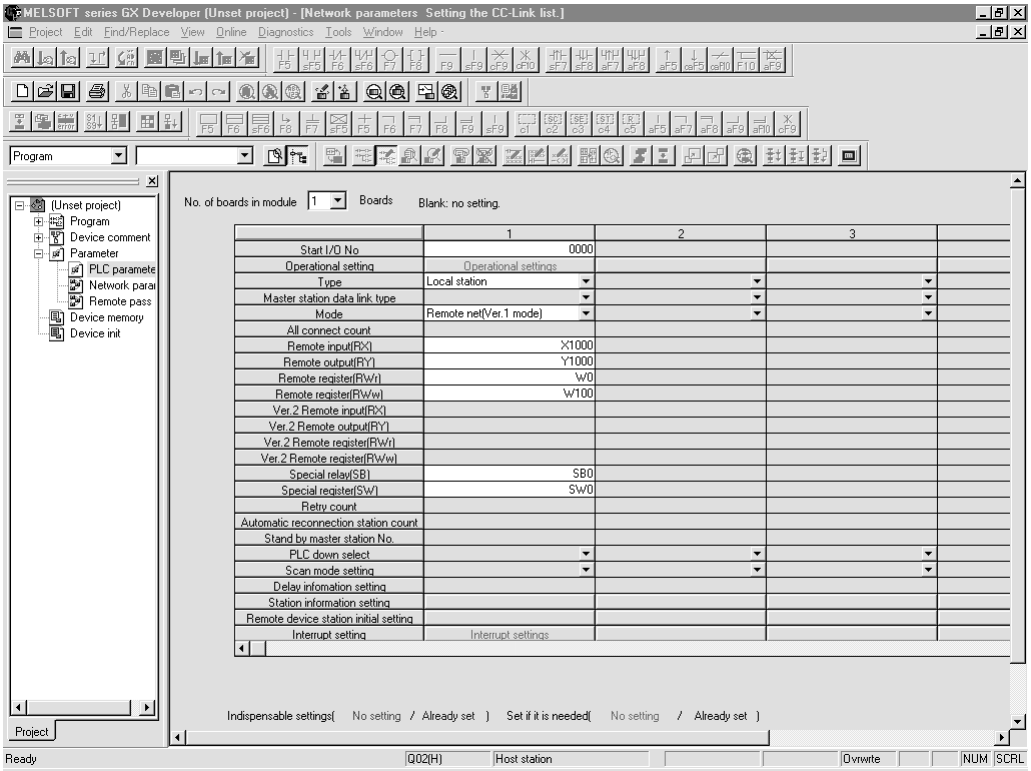
5) Set the refresh device for special relay (SB) to SB0.

6) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

A setting example is shown below.



(3) Setting the network parameters of the ver.2 compatible local station (station number 5)

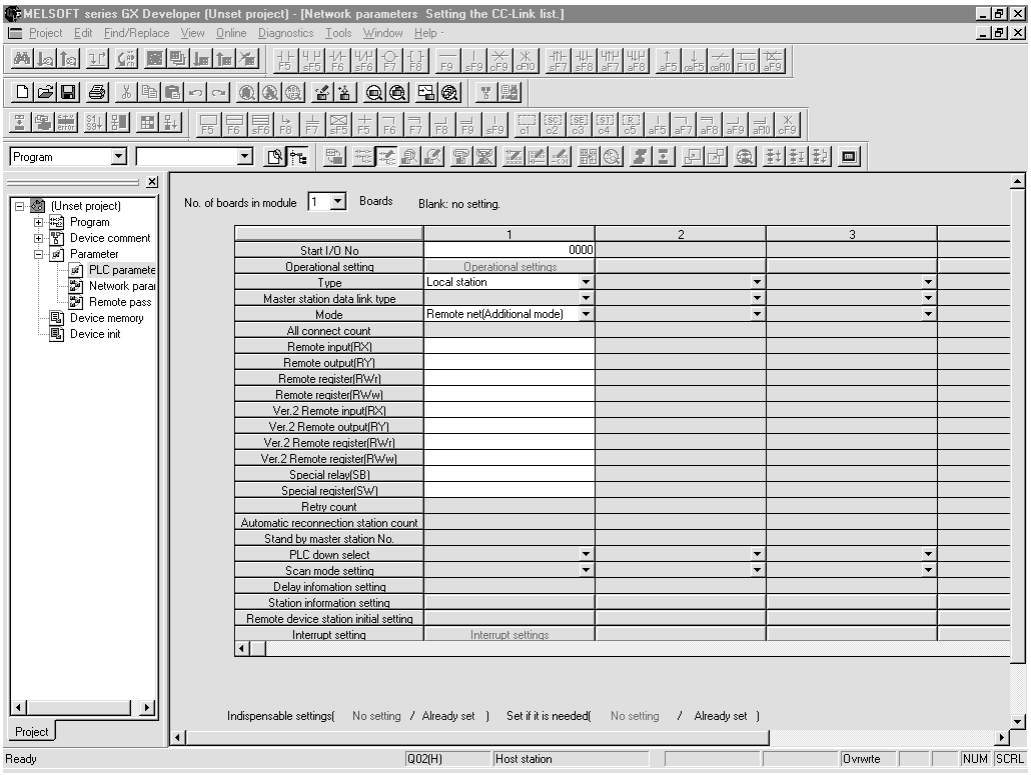
(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/(clear) |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | (Refresh)/Clears compulsorily |
| | Number of occupied stations | Occupies 1 to 4 stations<br>Default: Occupies 1 station | Occupies 2 stations |
| | Expanded cyclic setting | single/double/quadruple/octuple<br>Default: single | double |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | Master station<br>Master station (Duplex function)<br>(Local station)<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>(Remote net (Additional mode))<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | ~~modules~~ |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | ~~times~~ |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | ~~modules~~ |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | ~~Stop/continue~~ |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | ~~Asynchronous/synchronous~~ |
| Delay information setting | | Set 0. | |

### (b) Example of network parameter settings

An example of network parameter settings is shown below:



(4) Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

1) Set the refresh device for remote input (RX) to X1000.

2) Set the refresh device for remote output (RY) to Y1000.

3) Set the refresh device for remote register (RWr) to W0.

4) Set the refresh device for remote register (RWw) to W100.

5) Set the refresh device for ver.2 remote input (RX) to X1500.

6) Set the refresh device for ver.2 remote output (RY) to Y1500.

7) Set the refresh device for ver.2 remote register (RWr) to W1000.

8) Set the refresh device for ver.2 remote register (RWw) to W1500.

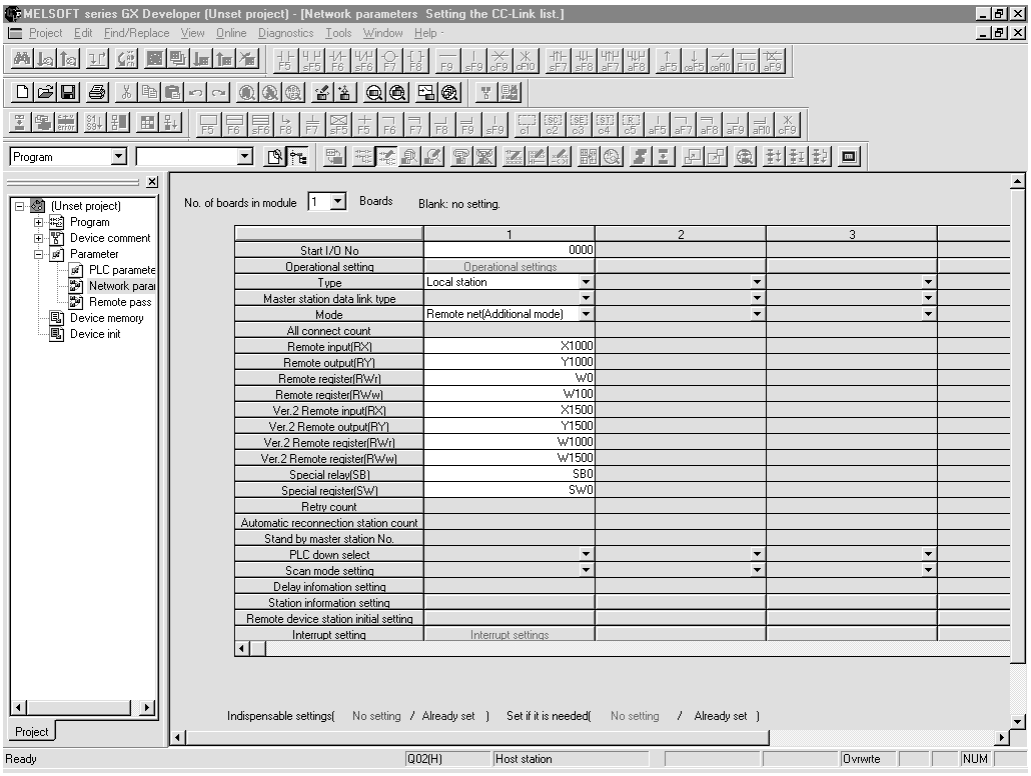
9) Set the refresh device for special relay (SB) to SB0.

10) Set the refresh device for special register (SW) to SW0.

| POINT |
|---|
| When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc. |

(b) Setting example

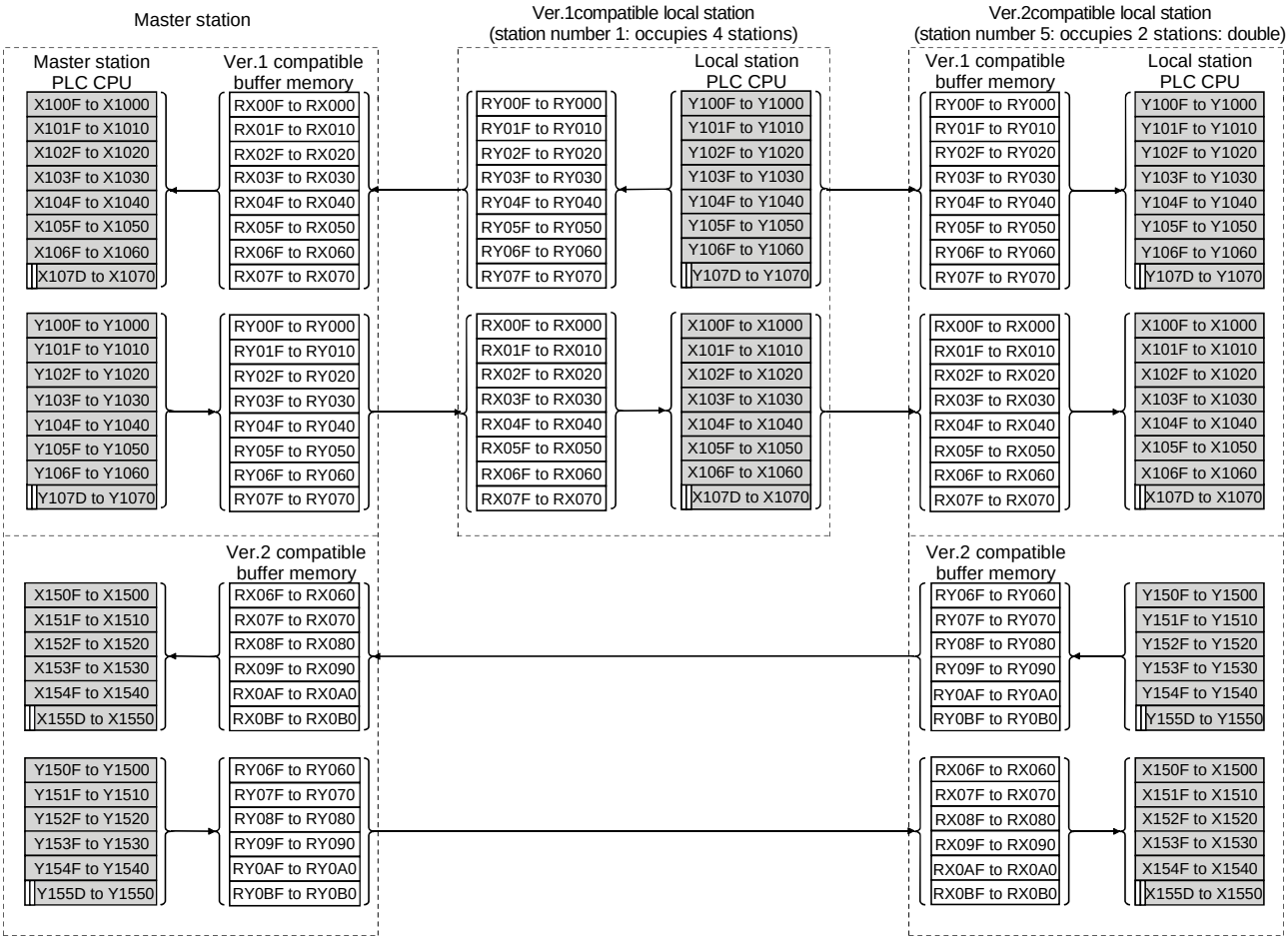
A setting example is shown below.



## 11.4.4 Creating a program

This section shows the program to be used for communication between the master and local stations. The following diagram shows the relationship between the devices of the master station PLC CPU and the devices of the local station PLC CPU.
The shaded areas indicate the devices that are actually used.

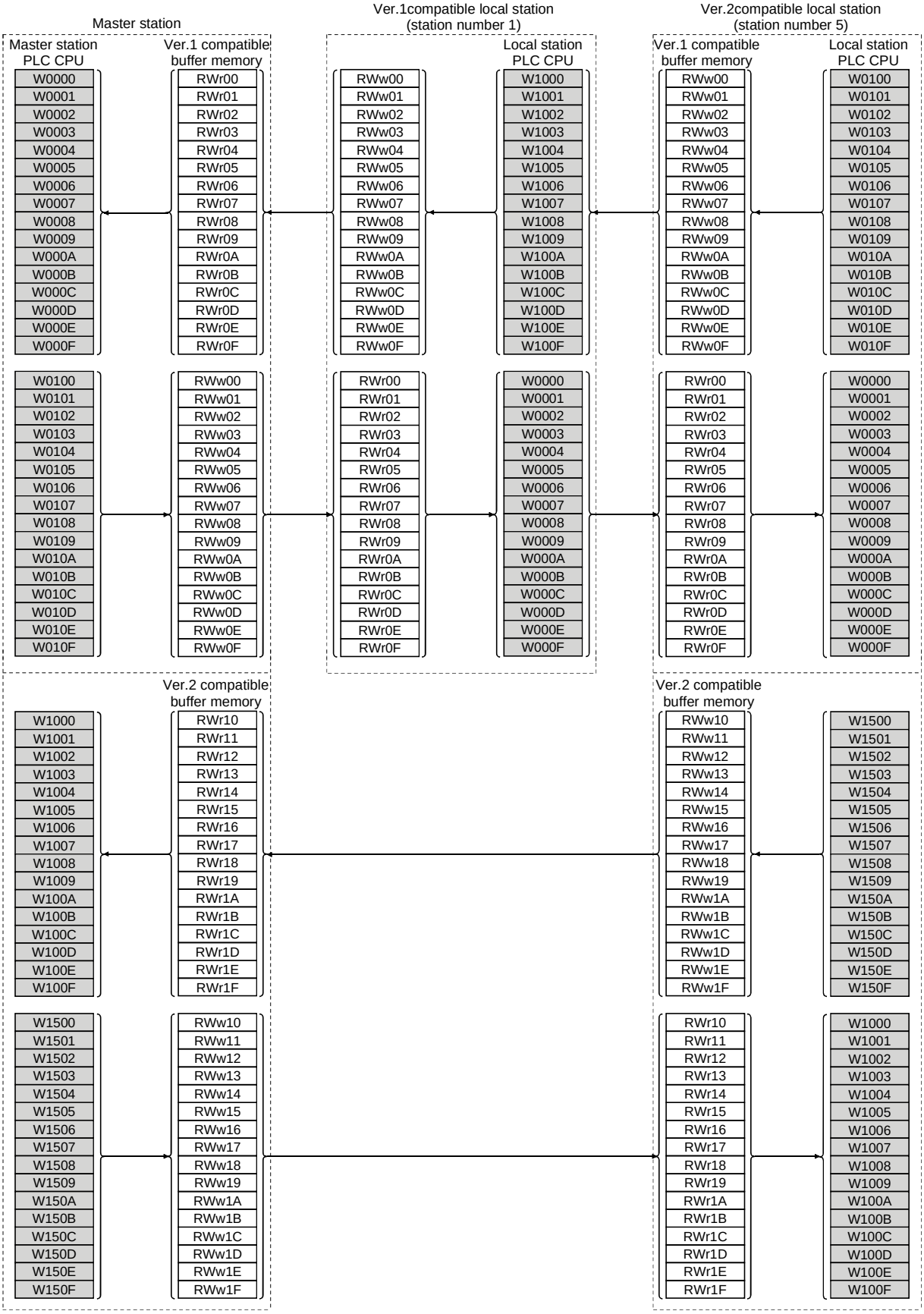
[Remote input (RX) and remote output (RY)]



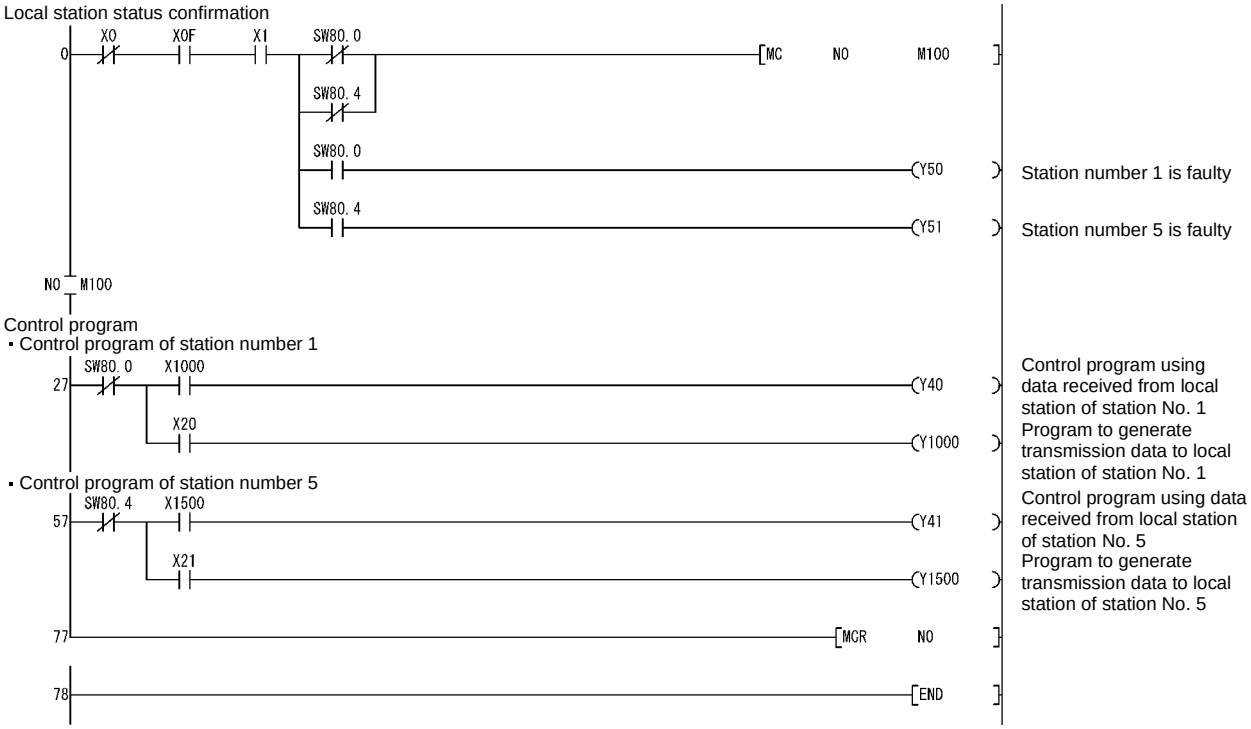

▯····· The last two bits cannot be used for communication between the master and local stations.


11 - 43

## [Remote registers (RWw and RWr)]

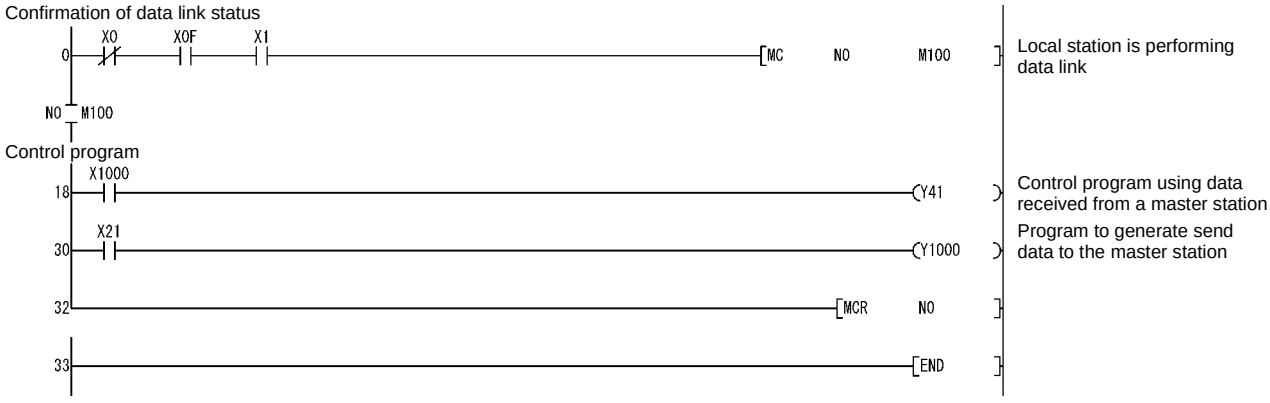

Master station
Master station PLC CPU
Ver.1 compatible buffer memory
Ver.1compatible local station (station number 1)
Local station PLC CPU
Ver.2compatible local station (station number 5)
Ver.1 compatible buffer memory
Local station PLC CPU
Ver.2 compatible buffer memory
Ver.2 compatible buffer memory

### (1) Master station program

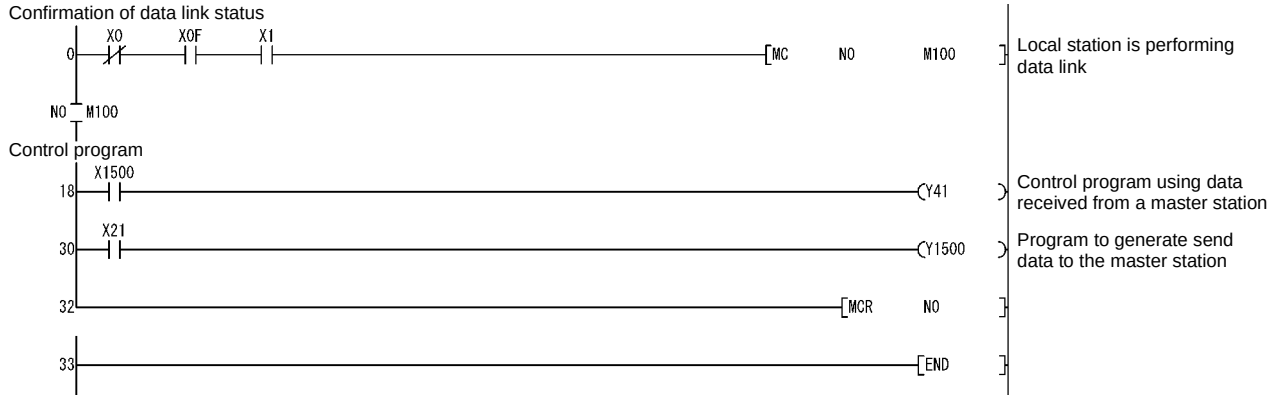



### (2) Local station program

#### (a) Ver.1 compatible local station (station number 1) program




#### (b) Ver.2 compatible local station (station number 5) program



REMARK

By configuring an interlock with remote I/O (RX/RY), cyclic data can be secured on a per-station (4-word) basis.
For details, refer to Remark in Section 11.2.4.

## 11.4.5 Performing the data link

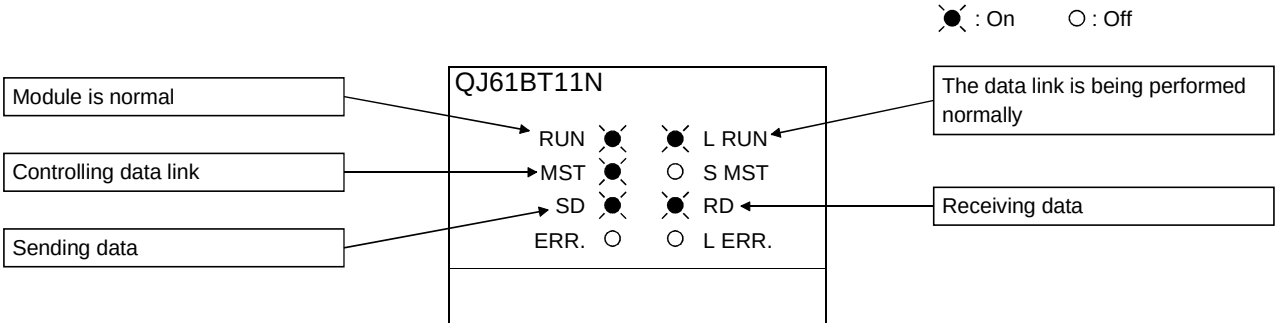
Turn on the power to the local station first, and then turn on the power to the master station to start the data link.

### (1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the local station when the data link is being performed normally.

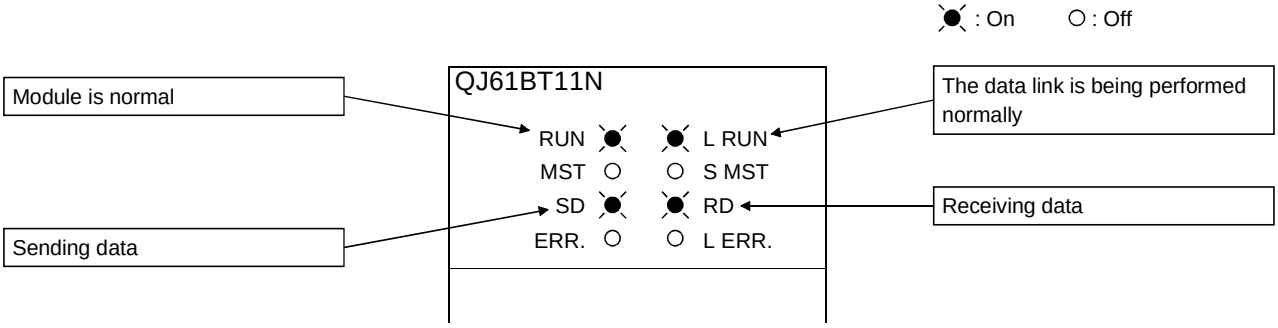
#### (a) LED display of the master station

Make sure that the LED display shows the following status:




#### (b) LED display of the local station

Make sure that the LED display shows the following status:



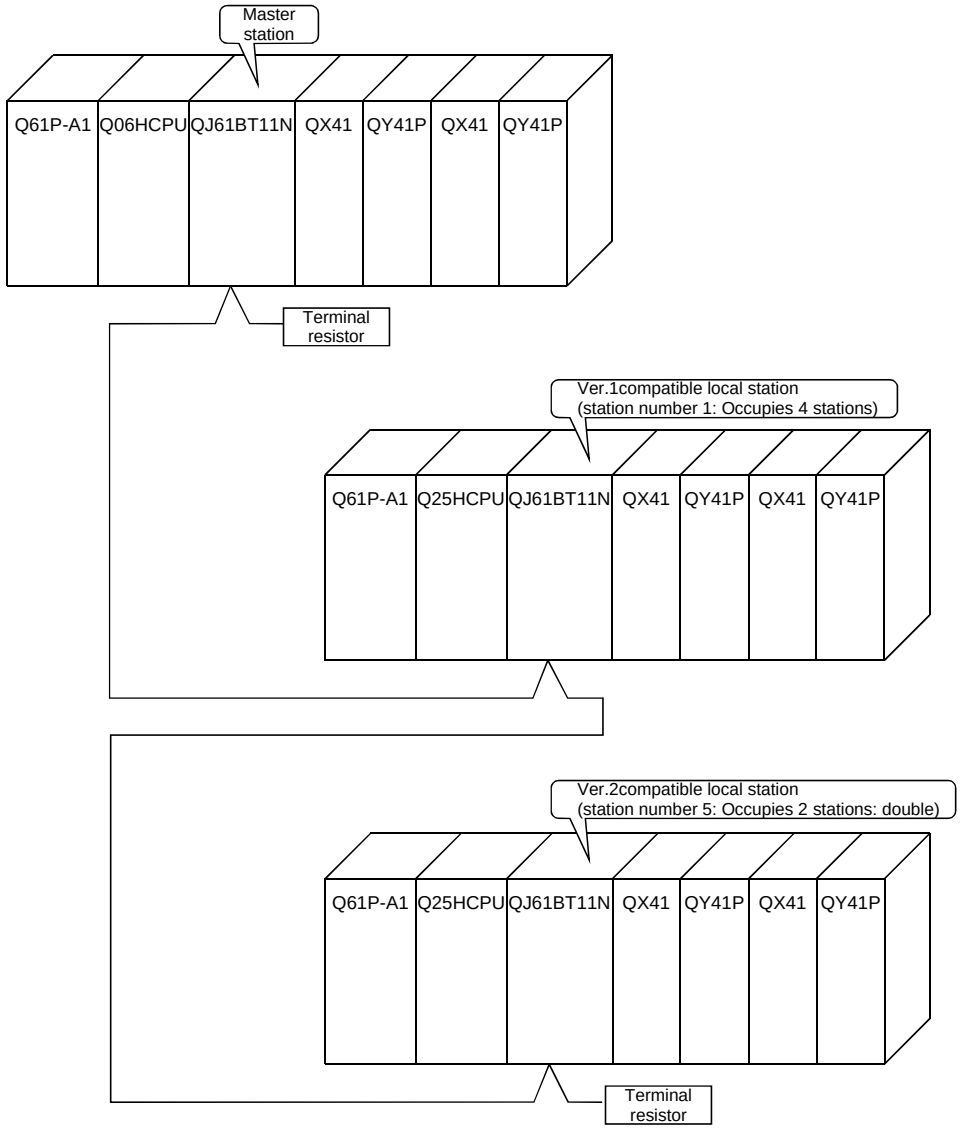


11 - 46

### (2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

1) When X20 of the master station is turned on, Y41 of the local station of station No. 1 turns on.
2) When X21 of the local station of station No. 1 is turned on, Y40 of the master station turns on.
3) When X21 of the master station is turned on, Y41 of the local station of station No. 5 turns on.
4) When X21 of the local station of station No. 5 is turned on, Y41 of the master station turns on.





11 - 47

# 12 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATIONS

The communication method between the master station and intelligent device stations is different for each intelligent device station.
For more details on the communication between the master station and intelligent device stations, see the manual for each intelligent device station.




12 - 1

# MEMO




12 - 2

# 13 TROUBLESHOOTING

This chapter describes the details of the problems that may occur in the CC-Link System, and lists the check items and procedures for each of the possible problems.

## 13.1 Verification upon Problem Occurrence

The following lists the details of the check items and procedures for each problem occurrence.

| Description of problem | Check item | Check procedure |
|---|---|---|
| Unable to perform data link for the entire system. | Are there any disconnected cables? | • Check the cable connection visually or with a line test.<br>• Check the line status (SW0090). |
| | Are terminal resistors connected to the terminal stations located at each end of the CC-Link system? | Connect the supplied terminal resistors to the terminal stations located at each end of the CC-Link system. |
| | Are correct terminal resistors connected? | Connect the appropriate terminal resistors that match the cable type used for the terminal stations located at each end of the CC-Link system. (See Section 7.5.) |
| | Has an error occurred at the master station's PLC CPU? | Check the error code of the PLC CPU and take corrective action. |
| | Are the CC-Link parameters set in the PLC CPU of the master station? | Check the contents of the parameters for the PLC CPU of the master station. |
| | Does the sequence scan time exceed the tolerance for each transmission rate when using the synchronous mode?<br>10 Mbps : 50 ms<br>5 Mbps : 50 ms<br>2.5 Mbps : 100 ms<br>625 kbps : 400 ms<br>156 kbps : 800 ms | Switch to the asynchronous mode, or reduce the transmission rate. |
| | Has an error occurred at the master station? | • Check the host parameter status (SW0068).<br>• Check the switch setting status (SW006A).<br>• Check the Loading status (SW0069).<br>• Check to see if the "ERR." LED on the master station is flashing. (See Section 13.2.) |
| Unable to receive input from a remote I/O station. | Is the corresponding remote I/O station performing data link? | • Check the LED display on the corresponding remote I/O station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data read from the correct address of remote input RX (buffer memory)? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)? | Check parameter information (SW0067). |
| | Is the corresponding remote I/O station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |

| Description of problem | Check item | Check procedure |
|---|---|---|
| Unable to receive input from a remote I/O station. | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| | Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| Unable to output data from a remote I/O station. | Is the corresponding remote I/O station performing data link? | • Check the LED display on the corresponding remote I/O station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data written to the correct address of remote output RY (buffer memory)? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| | Is the master station parameter information area being used (CPU built-in internal parameters, default parameters) correct? | Check parameter information (SW0067). |
| | Is the corresponding remote I/O station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| | Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| Unable to receive remote input (RX) of a remote device station. | Is the corresponding remote device station performing data link? | • Check the LED display on the corresponding remote device station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |

| Description of problem | Check item | Check procedure |
|---|---|---|
| Unable to receive remote input (RX) of a remote device station. | Is data read from the correct address of remote input RX (buffer memory)? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)? | Check parameter information (SW0067). |
| | Is the corresponding remote device station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| | Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| | Is the remote device station initialization procedure registration being executed? | Check if the remote device station initialization procedure registration instruction (SB000D) is on. |
| Unable to turn on/off remote output (RY) of a remote device station. | Is the corresponding remote device station performing data link? | • Check the LED display on the corresponding remote device station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data read from the correct address of remote output RY (buffer memory)? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)? | Check parameter information (SW0067). |
| | Is the corresponding remote device station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |

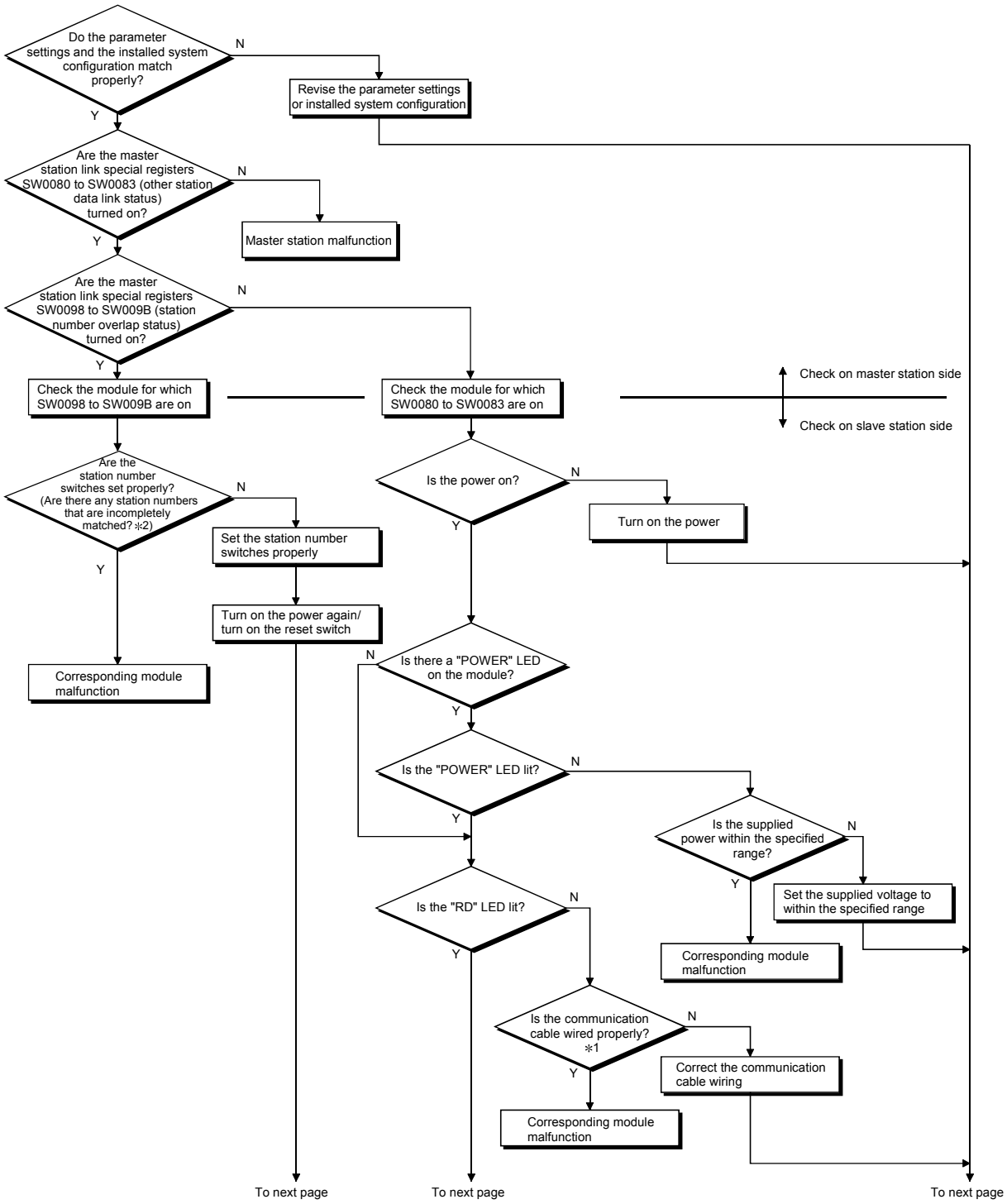
| Description of problem | Check item | Check procedure |
|---|---|---|
| Unable to turn on/off remote output (RY) of a remote device station. | Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| | Is the remote device station initialization procedure registration being executed? | Check if the remote device station initialization procedure registration instruction (SB000D) is on. |
| Unable to receive data to the remote register RWr in a remote device station. | Is the corresponding remote device station performing data link? | • Check the LED display on the corresponding remote device station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data read from the correct address of remote register RWr (buffer memory)? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)? | Check parameter information (SW0067). |
| | Is the corresponding remote device station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| | Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| | Is the remote device station initialization procedure registration being executed? | Check if the remote device station initialization procedure registration instruction (SB000D) is on. |
| Unable to write data to the remote register RWw in a remote device station. | Is the corresponding remote device station performing data link? | • Check the LED display on the corresponding remote device station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data written from the correct address of remote register RWw (buffer memory)? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)? | Check parameter information (SW0067). |
| | Is the corresponding remote device station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |

| Description of problem | Check item | Check procedure |
|---|---|---|
| Unable to write data to the remote register RWw in the remote device station. | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| | Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| | Is the remote device station initialization procedure registration being executed? | Check if the remote device station initialization procedure registration instruction (SB000D) is on. |
| Unable to communicate from the master station (remote output RY) to a local station (remote input RX). | Is the corresponding local station performing data link? | • Check the LED display on the corresponding local station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data written to the correct address of remote output RY (buffer memory) of the master station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is data read from the correct address of remote input RX (buffer memory) of the local station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the corresponding local station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| Unable to communicate from a local station (remote output RY) to the master station (remote input RX). | Is the corresponding local station performing data link? | • Check the LED display on the corresponding local station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data written to the correct address of remote output RY (buffer memory) of the local station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is data read from the correct address of remote input RX (buffer memory) of the master station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the corresponding local station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |

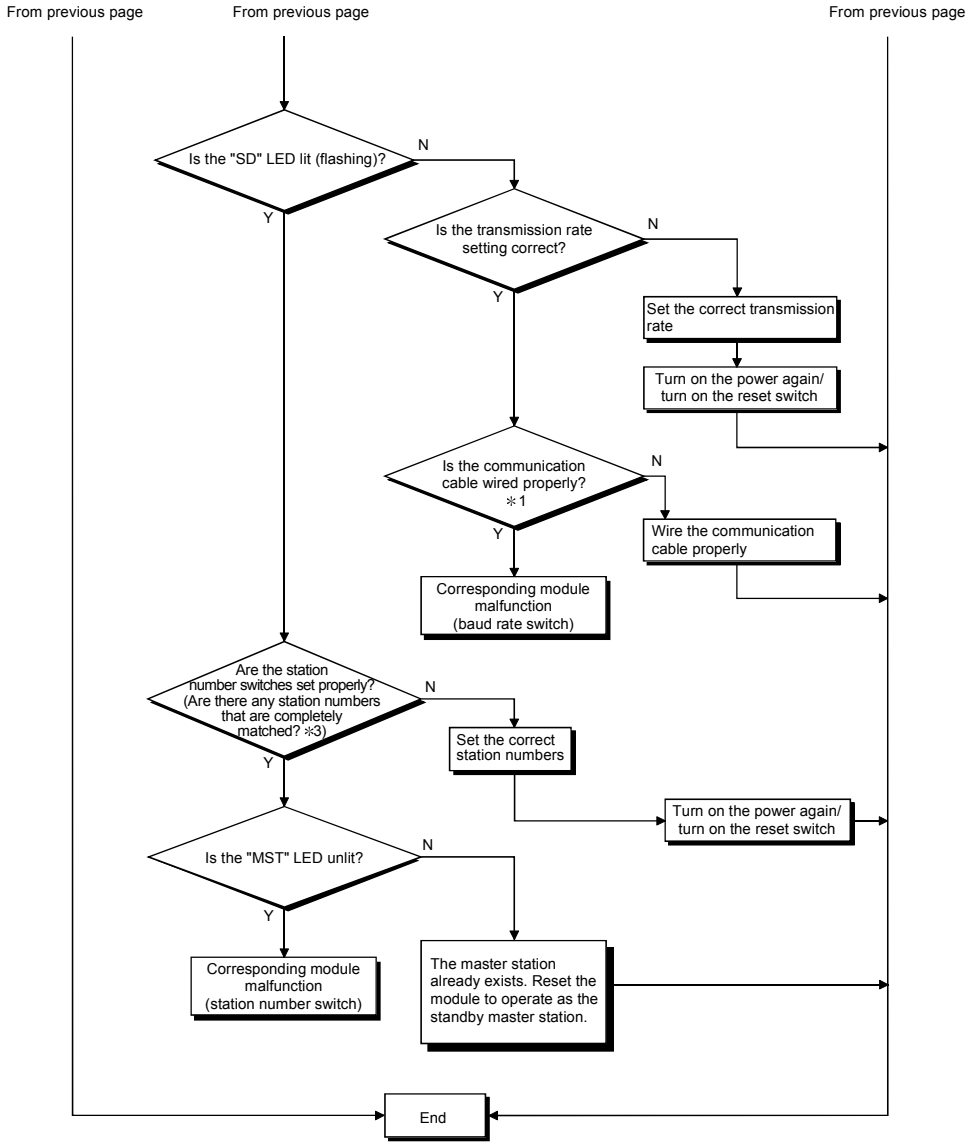
| Description of problem | Check item | Check procedure |
|---|---|---|
| Unable to communicate from a local station (remote output RY) to the master station (remote input RX). | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| Unable to communicate from the master station (remote register RWw) to a local station (remote register RWr). | Is the corresponding local station performing data link? | • Check the LED display on the corresponding local station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Do the number of occupied stations settings for a local station match to the station information for a master station? | |
| | Is data written to the correct address of remote register RWw (buffer memory) of the master station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is data read from the correct address of remote register RWr (buffer memory) of the local station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is the corresponding local station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| Unable to communicate from a local station (remote register RWw) to the master station (remote register RWr). | Is the corresponding local station performing data link? | • Check the LED display on the corresponding local station.<br>• Check the other station data link status of the master station. (SW0080 to SW0083) |
| | Is data written to the correct address of remote register RWw (buffer memory) of the local station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Is data read from the correct address of remote register RWr (buffer memory) of the master station? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |

| Description of problem | Check item | Check procedure |
|---|---|---|
| Unable to communicate from a local station (remote register RWw) to the master station (remote register RWr). | Is the corresponding local station number recognized by the master station? | • Check the parameters.<br>• Check the total number of stations (SW0070).<br>• Check the max. communication station number (SW0071).<br>• Check the number of connected modules (SW0072). |
| | Is the corresponding station set as a reserved station? | • Check the parameters.<br>• Check the reserved station specified status (SW0074 to SW0077). |
| | Are there any overlap station numbers? | • Check the station number setting.<br>• Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B). |
| | Do the settings match? | • Check the loading status (SW0069).<br>• Check the station number overlap status (SW0098 to SW009B).<br>• Check the loading/parameter consistency status (SW009C to SW009F). |
| Unable to operate the local station at the specified number of occupied stations. | Is the QJ61BT11 of function version A set to occupy 2 or 3 stations. | Set the number of occupied stations to 1 or 4. |
| Unable to stop data link. | Is the data link stop (SB0002) turned on? | • Check the sequence program.<br>• Check the automatic refresh parameter settings. |
| | Has an error occurred? | Check the data link stop result (SW0045). |
| Unable to restart data link. | Is the data link restart (SB0000) turned on? | • Check the sequence program.<br>• Check the automatic refresh parameter setting. |
| | Has an error occurred? | Check the data link restart result (SW0041). |
| | Is the corresponding station disconnected? | • Check the cable connection visually or with a line test.<br>• Check the parameters (for local station).<br>• Check the operation status of the PLC CPU in the corresponding station. |
| The remote station/local station/intelligent device station/standby master station does not start up. | Do the parameters for the number of modules and station information match the settings of the modules that do not start up? | Check the parameters. |
| | Are there any overlap station numbers? | Check the station number setting. |
| The local station/standby master station does not start up and the "ERR." LED turns on. | Check that the station number of the local station (including the number of occupied stations) is not 65 or more. | Check the station number setting switches and parameter of the local station/standby master station. |
| | Does the mode of the master station match the mode of the local station/standby master station? | Check the parameters of the master station and local station/standby master station. |
| | Check that the parameter of the master station that will return to the system by the standby master function has not been rewritten. | Check the parameter of the master station. |
| Faulty stations cannot be detected. | Is the station set as an error invalid station? | Check the parameters. |
| | Is the station number overlapped elsewhere? | Check the station number setting. |
| Faulty stations are generated depending on transmission rate. | Can the faulty station be identified using the other station data link status (SW0080 to SW0083)? | • Check the switch settings for the faulty station.<br>• Check that the cable is properly wired.<br>• Check that the shield of the cable is grounded.<br>• Connect the terminal resistor that matches the cable type used to the terminal stations located at each end of the CC-Link system. |
| | If the transmission rate is reduced to a lower level such as 156 kbps, can communication be performed without producing an error? | |
| When a dedicated instruction is executed, the abnormal completion bit turns on. | Has an error occurred? | • Check the error code for the PLC CPU.<br>• Check the error code for the master station.<br>• Check the operation status of the PLC CPUs for both the master station and the corresponding local station. |
| The remote device station is not operating normally. | Are there any errors in the initial settings of the remote device station? | • Check the parameters.<br>• Check the sequence program. |
| When multiple remote stations are powered off at 156 kbps, the "L RUN" LED goes off temporarily. | What is the setting for the retry count? | • Increase the transmission rate.<br>• Reduce the retry count. |
| CC-Link cannot be started automatically. | Has a value been set for the intelligent function module switch setting? | Disable the intelligent function module switch setting of GX Developer. |
| The abnormal completion bit turns on when the dedicated instruction (RLPASET) is executed. | Is the switch 4 setting of the intelligent function module switch settings correct? | Set switch 4 of the intelligent function module switch settings of GX Developer to $0100_H$. |
| | Are the various settings specified by the RLPASET instruction correct? | • Check the error code for the PLC CPU.<br>• Check the error code for the master station.<br>• Check the operation status of the PLC CPU for the master station. |
| | Has the parameter setting method been changed without turning the power supply to the PLC system off and back on, or resetting the PLC CPU? | Turn the power supply to the PLC system off and back on, or reset the PLC CPU. |
| If the condition returns to normal, the disconnected data link error station does not return to the system automatically. | Has the module been changed for the one having the different number of occupied stations and station type during data link? | Change the module for the one having the same number of occupied stations and station type. When changing the number of occupied stations and/or station type, reset the master station after changing. |
| GX Developer cannot communicate with the other station PLC CPU. | Check the error code in the Error dialog box of GX Developer. | Check the error code list and take corrective action. |
| | Does the PLC CPU of the station set in "Transfer setup" have an error? | Check the error code of the PLC CPU. |
| | Is the station set in "Transfer setup" executing data link? | Check whether the "L RUN" LED of the corresponding station is on or not. |

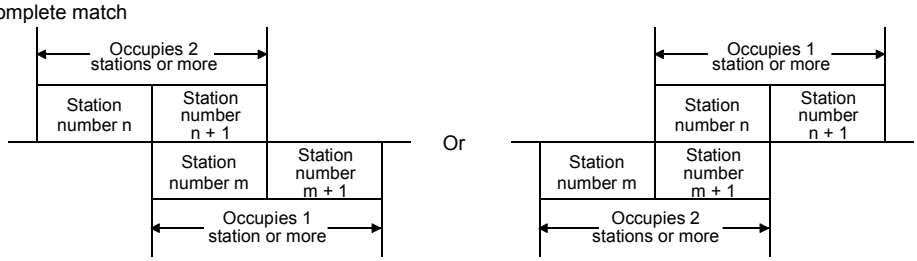
## 13.2 Troubleshooting Procedures When the "ERR." LED of the Master Station is Flashing or When Normal Data cannot be Sent/Received During Data Link


Do the parameter settings and the installed system configuration match properly?
N
Revise the parameter settings or installed system configuration
Y
Are the master station link special registers SW0080 to SW0083 (other station data link status) turned on?
N
Master station malfunction
Y
Are the master station link special registers SW0098 to SW009B (station number overlap status) turned on?
N
Y
Check the module for which SW0098 to SW009B are on
Check the module for which SW0080 to SW0083 are on
Check on master station side
Check on slave station side
Are the station number switches set properly? (Are there any station numbers that are incompletely matched? ∗2)
N
Set the station number switches properly
Turn on the power again/ turn on the reset switch
Y
Corresponding module malfunction
Is the power on?
N
Turn on the power
Y
Is there a "POWER" LED on the module?
N
Y
Is the "POWER" LED lit?
N
Y
Is the supplied power within the specified range?
N
Y
Set the supplied voltage to within the specified range
Corresponding module malfunction
Is the "RD" LED lit?
N
Y
Is the communication cable wired properly? ∗1
N
Y
Correct the communication cable wiring
Corresponding module malfunction
To next page
To next page
To next page

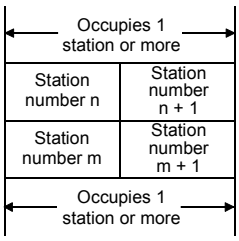
∗1: Check for short-circuits, reversed connection, disconnection, terminal resistors, FG connection, overall distance, and distance between stations.


From previous page
From previous page
From previous page
Is the "SD" LED lit (flashing)?
N
Y
Is the transmission rate setting correct?
N
Y
Set the correct transmission rate
Turn on the power again/ turn on the reset switch
Is the communication cable wired properly? *1
N
Y
Wire the communication cable properly
Corresponding module malfunction (baud rate switch)
Are the station number switches set properly? (Are there any station numbers that are completely matched? *3)
N
Y
Set the correct station numbers
Turn on the power again/ turn on the reset switch
Is the "MST" LED unlit?
N
Y
Corresponding module malfunction (station number switch)
The master station already exists. Reset the module to operate as the standby master station.
End

*2 Incomplete match


Occupies 2 stations or more
Station number n
Station number n + 1
Station number m
Station number m + 1
Occupies 1 station or more
Or
Occupies 1 station or more
Station number n
Station number n + 1
Station number m
Station number m + 1
Occupies 2 stations or more

*3 Complete match


Occupies 1 station or more
Station number n
Station number n + 1
Station number m
Station number m + 1
Occupies 1 station or more

## 13.3 Error Codes

Table 13.1 lists the error codes that are stored in the link special registers (SW).
When the standby master station is operating as the master station, the detectability is identical to that of the master station.
When the standby master is operating as a local station, the detectability is identical to that of the local station.

Table 13.1 Error code list (1/6)

| Error code (hexadecimal) | Error details | Cause of error occurrence (details) | Corrective action | Detectability | |
|---|---|---|---|---|---|
| | | | | Master station | Local station |
| 4000 to 4FFF | (Errors detected by the PLC CPU) | ——— | Handle by referring to the troubleshooting section of CPU User's Manual (Hardware Design, Maintenance and Inspection). | — | — |
| 7000 to 7FFF | (Errors detected by serial communication module, etc) | ——— | Handle by referring to the troubleshooting section of the Serial Communication Module User's manual | — | — |
| B110 | Transient data can not be received. | A line error has occurred. | Check the line. | ○ | ○ |
| B111 | Transient data receiving order error | A line error has occurred. | Check the line. | ○ | ○ |
| B112 | Transient data length error | A line error has occurred. | Check the line. | ○ | ○ |
| B113 | Transient data ID error | A line error has occurred or an instantaneous power failure has occurred at the send station. | Check the line, or check the supply power and power supply module of the send station. | ○ | ○ |
| B114 | Link error | A line error has occurred. | Check the line. | ○ | ○ |
| B115 | Link error | A line error has occurred. | Check the line. | ○ | ○ |
| B116 | Packet error | A line error has occurred. | Check the line. | ○ | ○ |
| B120 | Forced termination of the remote device station initialize procedure registration function | In the remote device station initialize procedure registration function, the specification of the remote device station initialize procedure registration was turned off before all procedures were completed. | Do not turn the specification of the remote device station initialize procedure registration off until all procedures are completed. | ○ | × |
| B124 | Error at a station on which the remote device station initialize procedure registration function was executed | The specification of the remote device station initialize procedure registration function was turned on at a station other than the master station. | Turn on the remote device station initialization procedure registration instruction on the master station (station No.0). | × | ○ |
| B125 | Parameter not set error of the remote device station initialize procedure registration function | The specification of the remote device station initialize procedure registration function was turned on without setting the remote device station initialize procedure registration. | Turn on the specification of the remote device station initialize procedure registration function after setting the remote device station initialize procedure registration. | ○ | × |
| B201 | Corresponding station error during sending | A data link error occurred at the corresponding station during transient transmission. | Check the communication status of other stations, whether or not a temporary error invalid station is specified, or if the corresponding station is stopped. | ○ | ○ |
| B205 | Transient target station error | A transient request was issued to other than the intelligent device station. | Check the target station. | ○ | ○ |
| B301 | Processing request error during link stop | Line test request was issued while the link was stopped. | Perform a line test while the link is being established | ○ | ○ |
| B302 | Specified station number setting error | The specified station number exceeded the highest communication station number during temporary error invalid request/temporary error invalid cancel request. | Specify a station number that is no greater than the highest communication station number. | ○ | × |
| B303 | Specified station number not set error | The station number was not specified during temporary error invalid request/temporary error invalid cancel request. | Set a specified station number. (SW0003, SW0004 to SW0007) | ○ | × |
| B304 | Line test error station detected | An error was detected in a remote station, intelligent device station or standby master station when a line test was performed. | Check that the remote station, intelligent device station or standby master station is operational and that the cable is not disconnected. | ○ | × |
| B306 | Specified station number setting error | A station number other than the head station number was specified during temporary error invalid request/temporary error invalid cancel request. | Specify a head station when temporary error invalid request/temporary error invalid cancel request is requested. | ○ | ○ |
| B307 | All stations data link error | All stations were in data link error status when one of the following requests was made:<br>• SB0000 (data link restart)<br>• SB0002 (data link stop) | Request again after the data link becomes normal. | ○ | ○ |
| B308 | Station number setting error (installation status) | The station number of the slave station is outside of the range between "1 and 64". | Set the station number of the slave station within the range between "1 and 64". | ○ | × |
| B309 | Station number overlap error | The station number of the connected module was duplicated (including number of occupied stations). However, this excludes the duplicate head station number. | Check the module station number. | ○ | × |

Table 13.1 Error code list (2/6)

| Error code (hexadecimal) | Error details | Cause of error occurrence (details) | Corrective action | Detectability | |
|---|---|---|---|---|---|
| | | | | Master station | Local station |
| B30A | Loading/parameter compatibility error | The station types of the module are different from parameter settings.<br>Example)<br>Connected module: Remote device / Intelligent device<br>Parameter setting: Remote I/O / Remote I/O / Remote device | Set the correct parameters. | ○ | × |
| B30B | Loading/parameter compatibility error | The contents of the installation status and network parameters do not match. | Set the contents of the installation status and network parameters to match. | ○ | × |
| B30C | Standby master station specification error | Master station switching was instructed to a station other than the standby master station. | Specify the station number that corresponds to the standby master station. | ○ | ○ |
| B30D | Initial status | Temporary error invalid station specification and line test requests were issued before starting the link. | Issue the requests after the data link is started. | ○ | × |
| B30E | Unsupported error | In the function started by SB/SW, an attempt was made to execute the function, which is supported by only the master station, at the local station. | Execute the corresponding function from the master station. | × | ○ |
| B30F | Temporary error invalid station specification error | A temporary error invalid station was specified while the data link is being performed upon automatic CC-Link startup. | Specify a temporary error invalid station while the data link is performed with parameters set using GX Developer or the dedicated instruction. | ○ | × |
| B310 | Data link restart error | Data link restart (SB0000) was executed for the station that was performing a data link. | Execute Data link restart (SB0000) for the station that has stopped a data link with Data link stop (SB0002). | ○ | ○ |
| B311 | Data link stop error | Data link stop (SB0002) was executed for the station that had stopped a data link. | Execute Data link stop (SB0002) for the station that is performing a data link. | ○ | ○ |
| B312 | Standby master station absence error | Forced master to standby master switching (SB000C) was executed in the system where no standby master station exists or in the system where the standby master station had become faulty. | After starting the data link of the standby master station, execute Forced master to standby master switching (SB000C). | ○ | × |
| B313 | All station fault error | Forced master to standby master switching (SB000C) was executed in the system where all stations had become faulty. | After starting the data link of the standby master station, execute Forced master to standby master switching (SB000C). | ○ | × |
| B314 | Switching target error | Forced master to standby master switching (SB000C) was executed for any station other than the master station. | Execute Forced master to standby master switching (SB000C) for the master station. | × | ○ |
| B315 | Forced master station switching error | Forced master switching (SB000C) was instructed again while the master station was being switched to the standby master station. | Check ON/OFF of Forced master switching (SB000C). | ○ | × |
| B317 | Network startup setting mode error | The RLPASET instruction was executed for a module whose parameters have been set by GX Developer.<br>The parameter setting was changed without turning the power supply to the PLC system off and back on, or resetting the PLC CPU. | Use the RLPASET instruction according to the procedure below.<br>1. Clear the settings of the network parameters and refresh parameters of the target module using GX Developer.<br>2. Set the type of I/O assignment setting in GX Developer to "intelli."<br>3. Set switch 4 of the intelligent function module switch setting in GX Developer to $0100_H$.<br>4. Turn the power supply to the PLC system off and back on, or reset the PLC CPU. | ○ | × |
| B381 | Station number switch setting error | The station number switch was outside of the setting range. | Set the station number switch within the setting range. | ○ | ○ |
| B383 | Transmission rate setting switch setting error | The transmission rate setting switch is set outside the range. | Set the transmission rate setting switch to within the setting range. | ○ | ○ |

Table 13.1 Error code list (3/6)

| Error code (hexadecimal) | Error details | Cause of error occurrence (details) | Corrective action | Detectability | |
|---|---|---|---|---|---|
| | | | | Master station | Local station |
| B384 | Station number setting error (parameter) | The station number (including the number of occupied stations) of the station information parameters was set to "other than $1_H$ to $40_H$." | Set within the range of "$1_H$ to $40_H$". | ○ | × |
| B385 | Total number of stations error (parameter) | The total number of occupied stations set with the station information parameter exceeded 64. | Set a parameter value of 64 or less. | ○ | × |
| B386 | Number of occupied stations setting error (parameter) | The number of all occupied stations in the station information parameter was set to "0". | Set the occupied station number to a value between "1 and 4". | ○ | × |
| B387 | Delay time setting error (parameter) | The delay time setting in the master station network parameters is out of the setting range. | Set a value within the setting range. | ○ | × |
| B388 | Station type setting error (parameter) | The station type in the station information parameter was set to "other than 0 to 2". | Set to a value between "0 and 2". | ○ | × |
| B38B | Remote device station setting error (parameter) | The number of remote device stations was set to "43 stations or more" with the station information parameter. | Set the remote device station to "42 stations or less" with the station information parameter. | ○ | × |
| B38C | Intelligent device station setting error (parameter) | The number of intelligent device stations (including local stations) was set to "27 stations or more" with the station information parameter. | Set the intelligent device station to "26 stations or less" with the station information parameter. | ○ | × |
| B38D | Invalid station specified error (parameter) | "Other than module head station number" or "station number not specified in the parameter" was set with the invalid station specification parameter.<br><Example of other than head station number><br>A bit other than that for station number 5 was ON for a module occupies 4 stations (station numbers 5 to 8). | Set the "Head station number of the module".<br>Do not specify any of the stations not specified with the parameter. | ○ | × |
| B38E | Communication buffer assignment error (parameter) | The total size of the communication buffers in the station information parameter exceeded 4 k words. | Set the total size of the communication buffers to 4 k words or less. | ○ | ○ |
| B38F | Automatic update buffer assignment error (parameter) | The total size of the automatic update buffer in the station information parameter exceeded 4 k words. | Set the total size of the automatic update buffer to 4 k words or less. | ○ | ○ |
| B390 | Standby master station specification error (parameter) | The standby master station parameter was set to a value other than "1 to 64". | Specify the standby master station to a value within the range from "1 to 64". | ○ | ○ |
| B391 | Retry count setting error (parameter) | The retry count parameter was set to a value other than "1 to 7". | Set a value within the range from "1 to 7". | ○ | × |
| B392 | Operation when CPU is down specified error (parameter) | The operation when the CPU is down specification parameter was set to a value other than "0 or 1". | Set "0 or 1". | ○ | × |
| B393 | Scan mode specification error (parameter) | The scan mode parameter was set to a value other than "0 or 1". | Set "0 or 1". | ○ | ○ |
| B394 | Number of automatic return stations setting error (parameter) | The number of automatic return stations parameter was set to a value other than "1 to 10". | Set a value within the range from "1 to 10". | ○ | × |
| B396 | Station number overlap error (parameter) | A duplicate station number was specified with the station information parameter. | Set so that station numbers are not duplicated. | ○ | × |
| B397 | Station information setting error (parameter) | The station information parameter setting does not meet the following condition:<br>$(16 \times 4) + (54 \times B) + (88 \times C) \leqq 2304$<br>A: Number of remote I/O stations<br>B: Number of remote device stations<br>C: Number of intelligent device stations (including local stations) | Set the parameter so that it meets the condition shown on left. | ○ | × |
| B398 | Number of occupied stations setting error (parameter) | The number of occupied stations in the station information parameter was set to a value other than "1 to 4". | Set a value within the range from "1 to 4". | ○ | × |
| B399 | Number of connected modules setting error (parameter) | The number of connected modules parameter was set to a value other than "1 to 64". | Set a value within the range from "1 to 64". | ○ | × |

Table 13.1 Error code list (4/6)

| Error code (hexadecimal) | Error details | Cause of error occurrence (details) | Corrective action | Detectability | |
|---|---|---|---|---|---|
| | | | | Master station | Local station |
| B39A | Standby master station specification error (loading status) | The station number set with the station number setting switches of the standby master station differs from that set in the "standby master station No." network parameter of the master station, or the station set in the "standby master station No." network parameter of the master station is a local station. | Change the parameter setting of the master station, or change the station number setting of the local/standby master station, and then reset the PLC CPU of the local/standby master station. | × | ○ |
| B39B | Reserved station setting error | All stations were set as reserved stations. | Check the reserved station settings. | ○ | × |
| B39C | Standby master station setting error | Any other than Intelligent device station has been set to the station type for the "Standby master station No." specified in the master station network parameter. The mode setting is different between the master and standby master stations. | Specify the standby master station as an intelligent device station. Make the same setting to the master and standby master stations. | ○ | × |
| B39D | Reserved station 0 points setting error | Reserved station 0 points setting has been made in the remote net additional mode. | Change the mode to the remote net ver. 2 mode. | ○ | × |
| | | Reserved station 0 points setting has been made for the station that is not a reserved station. | Set the station of reserved 0 points setting as a reserved station. | | |
| B39E | 8/16-point remote I/O station setting error | Remote I/O station points setting is 8/16 points in the remote net additional mode. | Change the mode to the remote net ver. 2 mode. | ○ | × |
| | | 8/16 points setting has been made for the station other than the remote I/O station. | 8 points setting and 16 points setting have been made for the same remote I/O station. | | |
| | | Make 8/16 points setting for the same remote I/O station. | Make either 8 points setting or 16 points setting for the remote I/O station. | | |
| B39F | Remote net additional mode station number illegal | In the remote net additional mode, the "maximum station number of ver. 1 compatible slave stations" is greater than the "minimum station number of ver. 2 compatible slave stations" in the network parameter setting. | In the remote net additional mode, make network parameter setting so that the "maximum station number of ver. 1 compatible slave stations" is less than the "minimum station number of ver. 2 compatible slave stations". | ○ | × |
| B3A0 | Mode illegal (between master and local/standby master stations) | Model illegal has occurred between the master and local/standby master stations.<br>• The mode differs between the master and standby master stations.<br>• The local station is set to the remote net additional mode, and the master station is set to other than the remote net additional mode.<br>• The local station is in the remote net ver. 2 mode or remote net additional mode, and the master station is in the remote net ver. 1 mode. | After correcting the mismatch of modes between the master and local/standby master stations, reset the PLC CPU. | × | ○ |
| B3A1 | Standby master setting illegal | At the time of parameter setting with dedicated instruction, an illegal value has been set to switch 5 of the intelligent function module switch setting. | Set a correct value to switch 5 of the intelligent function module switch setting. | ○ | × |
| B3A2 | Remote I/O net mode station type illegal | At the time of parameter setting with dedicated instruction, the station type of other than the remote I/O station has been set in the remote I/O net mode. | Set all station types to the remote I/O station. | ○ | × |
| B3A3 | Assignment error | In the remote net Ver.2 mode or remote net additional mode, total points for remote stations set in the station information has exceeded the maximum of 8192. | Check the points for remote stations in the station information setting. | ○ | × |
| B3A4 | Parameter mismatch | When the standby master station was operating as the master station with the master station duplex function, the network parameter setting of the faulty master station was changed. | Return the network parameter setting of the master station to the original value. | ○ | × |
| B3A5 | Mode illegal (parameter) | The mode set in the control data of the RLPASET instruction differs from the mode set with switch 3 of the intelligent module switch setting. | Check the control data of the RLPASET instruction and the switch 3 setting of the intelligent module switch setting. | ○ | × |

Table 13.1 Error code list (5/6)

| Error code (hexadecimal) | Error details | Cause of error occurrence (details) | Corrective action | Detectability | |
|---|---|---|---|---|---|
| | | | | Master station | Local station |
| B401 | Parameter change error | Parameter change was executed during transient request. | Change the parameter after all transient requests are completed or before any are requested. | ○ | ○ |
| B404 | Response error | A response from the requested station was not returned within the watchdog time period. | Set a longer watchdog time. If an error persists, check the requested module and cables. | ○ | ○ |
| B405 | Transient applicable station error | A transient request was made to a remote I/O station or a remote device station. | Set the corresponding station to a local station or an intelligent device station. | ○ | ○ |
| B410 | Receive buffer size error | The receive buffer size of the dedicated instruction is less than the response data size. | Check the receive buffer size. | ○ | ○ |
| B411 | Data length outside of range | The number of read/write points in the control data of the dedicated instruction is outside the setting range. | Change the number of read/write points to within the setting range. | ○ | ○ |
| B412 | Station number outside of range | The station number in the control data of the dedicated instruction is outside the setting range. | Change the station number to within the setting range. | ○ | ○ |
| B413 | Request error | Multiple dedicated instructions were executed for the same station. | Check the sequence program. | ○ | ○ |
| B414 | Interlock signal data outside of range | The setting of the interlock signal storage device of the RIRCV or RISEND instruction is outside the setting range. | Change the setting of the interlock signal storage device to within the setting range. | ○ | × |
| B601 | Request type error | An unsupported request was received. | Check the contents of the request, as well as the target station number. | ○ | ○ |
| B602 | Transient request overload error | There are too many transient requests to the corresponding station. | Wait a while and then send the requests (transient overload status). | ○ | ○ |
| B603 | Transient request overload error | There are too many transient requests to the corresponding station. | Wait a while and then send the requests (transient overload status). | ○ | ○ |
| B604 | Line test in processing | Transient transmission was sent when a line test was in progress. | Wait a while and then retransmit. | ○ | × |
| B605 | Transient storage buffer could not be obtained | Transient storage buffer could not be obtained. | Wait a while and then retransmit. | ○ | ○ |
| B607 | Target station CPU error | There is an error in the target station's CPU. | Check the target CPU. | ○ | ○ |
| B771 | Transient request overload error | There are too many transient requests to the corresponding station. | Wait a while and then retransmit (transient overloaded status). | ○ | ○ |
| B774 | Transient request error | The target station was not an intelligent device station. | Check if the target station is an intelligent device station. | ○ | ○ |
| B778 | Response time out | A response was not received from the requested station. | Check the requested module and cables. | ○ | ○ |
| B780 | Module mode setting error | A transient transmission was executed even though the target station was set to the I/O mode. | Set to the remote net mode. | ○ | ○ |
| B782 | Station number specification error | The transmission destination and source stations were the same when other station connection was specified. | Check the transmission destination station number, or change to host connection. | ○ | ○ |
| B783 | Transient storage buffer error | An error occurred in the transient storage buffer when a transient transmission of greater than 1 k was being performed. | Wait a while and then retransmit. | ○ | ○ |
| B801 | Access code setting error | A non-existing access code/attribute was set. | Set a correct access code/attribute. | ○ | ○ |
| B802 | Access code error | An access code that does not exist was used. | Use the correct access code. | ○ | ○ |
| B803 | Data points error | The number of data points were out of range. | Set the number of data points to within 1 to 960 bytes. | ○ | ○ |

Table 13.1 Error code list (6/6)

| Error code (hexadecimal) | Error details | Cause of error occurrence (details) | Corrective action | Detectability | |
|---|---|---|---|---|---|
| | | | | Master station | Local station |
| B804 | Attribute definition error<br>Transient transmission unsupported station specification error | The attribute definition was invalid.<br>Alternatively, transient transmission was performed even though the target station does not support transient transmission. | Review the attribute definition.<br>Check the designation of the target station number, as well as the function version and software version of the target local station. | ○ | ○ |
| B805 | Data points error | The number of data was out of range. | Set the range to within 1 to 100 when writing, and 1 to 160 when reading. | ○ | ○ |
| B807 | Address definition error | The address was not a multiple of 16 when the bit device was accessed. | Set the address to a multiple of 16 when accessing the bit device. | ○ | ○ |
| B80D | Setting range error | The specified combination (addresses and points) exceeded the valid processing range. | Set so that the number of processing points does not exceed the device range . | ○ | ○ |
| B814 | File register capacity setting error | The file register capacity was not specified. | Specify the file register capacity. | ○ | ○ |
| B815 | Module mode setting error | A transient transmission was executed when the target station was set to the I/O mode. | Set to the intelli mode. | ○ | ○ |
| B823 | Remote control mode error | The mode setting of the remote control was incorrect. | Check the mode specification. | ○ | ○ |
| B903 | Transient request error | A transient request was issued to a station that has not secured a communication buffer area. | Secure a communication buffer area with a parameter. | ○ | ○ |
| B904 | Communication buffer size setting error | The communication buffer size of the corresponding station was out of range when a dedicated instruction was executed. | Set the communication buffer size of the corresponding station within the range. | ○ | ○ |
| B905 | Transient data length error | When the dedicated instruction is executed, the transient data length is greater than the communication buffer size of the corresponding station. | Make the communication buffer size of the corresponding station greater than the transient data length. | ○ | ○ |
| BA19 | Corresponding station error | The corresponding station that is being tested stopped communication during line test 1. | Check the cable and the corresponding station. | ○ | × |
| BA1B | All stations error | All stations stopped communications during line test 1. | Check the cables. | ○ | × |
| BBC2 | Station number setting error | The station number setting switch setting of the module is other than "0 to 64".<br>Alternatively, the last station number is greater than 64. | Check the station number and the number of occupied stations of the module. | ○ | ○ |
| BBC5 | Master station overlapping error | Multiple master stations exist on the same line.<br>Alternatively, line noise was detected at power on. | Reduce the number of master stations on the same line to one.<br>Alternatively, check the line status. | ○ | × |
| BD85 | Hardware error detection | A hardware error was detected. | There is most likely a hardware error in either the QJ61BT11N, the CPU module, the base unit or other modules. Contact your nearest Mitsubishi representative. | ○ | ○ |
| BFFB | Transient request overload error | There are too many transient requests to the corresponding station. | Wait for a while before transmitting again (transient overload status). | ○ | ○ |
| BFFE | CPU monitoring timer time out | The CPU monitoring timer timed out. | Check the operation of the target station. | ○ | ○ |
| C000 to CFFF | (Errors detected by the Ethernet module) | ——— | Handle by referring to the troubleshooting section of the Ethernet Interface Module User's manual. | — | — |
| F000 to FFFF | (Error detected by the MELSECENT/H, MELSECNET10 network system | ——— | Handle by referring to the troubleshooting section of the MELSECNET/H, MELSECNET/10 network system reference manual | — | — |

## 13.4 CC-Link Diagnostics Using the GX Developer

Check the status of each module after all the modules have been connected using CC-Link dedicated cables, and verify that data link can be performed normally.
It is also possible when the QJ61BT11N is mounted on the remote I/O station of MELSECNET/H.

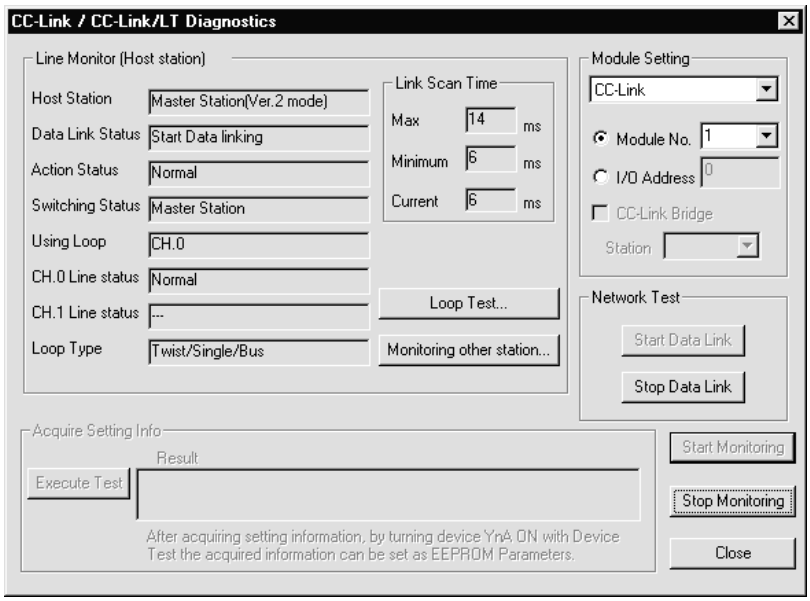
### (1) Host monitoring

This function monitors the items such as the data link status of the host (the station to which peripheral devices are connected).

(a) Operating procedure

[Diagnostics] → [CC-Link / CC-Link/LT diagnostics]

1) Select "CC-Link" for "Module Setting".
2) Specify the target module of Host monitoring for "Module No." or "I/O Address".
3) Click the Start Monitoring button.




(b) Monitoring items

1) Host station
   Indicates the type (master station, local station, standby master station) of the monitored station and the mode* of CC-Link.
   For a local station, the station number is also displayed.
   ∗Not displayed in the remote net ver. 1 mode.
2) Data link status
   Displays the data link status of the host.
3) Action status
   Displays the operating status of the host.
4) Switching status
   Displays whether the data link is controlled by the master station or standby master station.
5) Using loop
   Displays the line in use.
6) Line status
   Displays the line status.
7) Loop type
   Displays the line type.

| POINT |
| --- |
| When conducting a network test, do not perform write to buffer memory address 5E0H. |

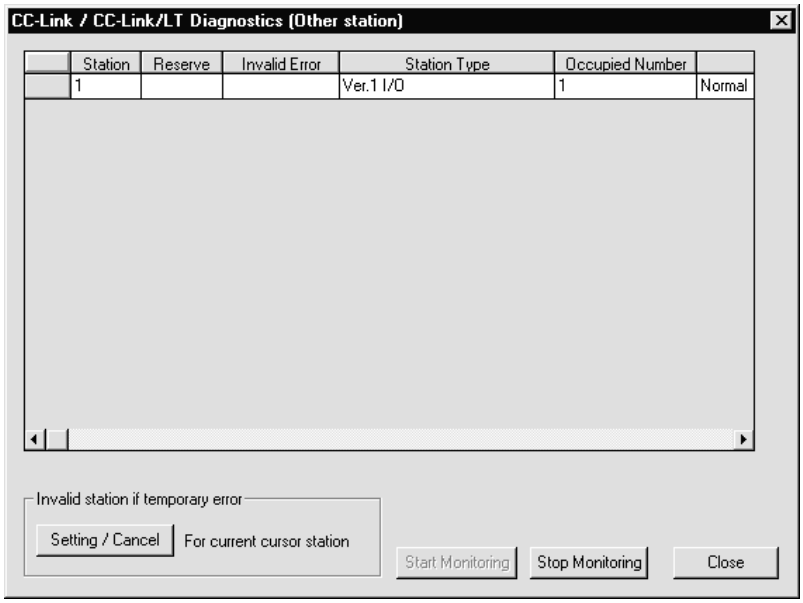
## (2) Other station monitoring

This function monitors the items such as the data link status of other stations (stations other than the one to which peripheral devices are connected).

(a) Operating procedure

[Diagnostics] → [CC-Link / CC-Link/LT diagnostics]

1) Select "CC-Link" for "Module Setting".
2) Specify the target master module of Monitoring other station for "Module No." or "I/O Address".
3) Click the Start Monitoring button.
4) Click the Monitoring other station button.




(b) Monitoring items

1) Station
   Displays the head station number of each station.
2) Reserve
   Displays whether or not a reserved station is set.
   "*": Reserved station is set.
   " ": Reserved station is not set.
3) Invalid error
   Displays whether or not an error invalid station is set.
   "*": Error invalid station is set.
   " ": Error invalid station is not set.

4) Station type
   Displays the station type.
   The CC-Link compatible version is also displayed in the remote net ver. 2 mode or remote net additional mode.
   "Intelli": Local station, intelligent device station and standby master station
   "I/O" : Remote I/O station
   "Device" : Remote device station
5) Number of occupied stations
   Displays the number of occupied stations.
6) Status
   Displays the link status of the module.
7) Transient error
   Displays whether or not an error occurred during transient transmission.
   "∗": Error occurred.
   " ": Error did not occur.
8) Expanded cyclic setting*
   Displays the expanded cyclic setting.
9) Remote station points*
   Displays the numbers of remote input and output (RX, RY) points of the remote, local, intelligent device and standby master stations.

∗Not displayed in the remote net ver. 1 mode.

| POINT |
| --- |
| When making temporary error invalid station setting, do not perform write to buffer memory addresses 5E0H, 603H to 607H. |

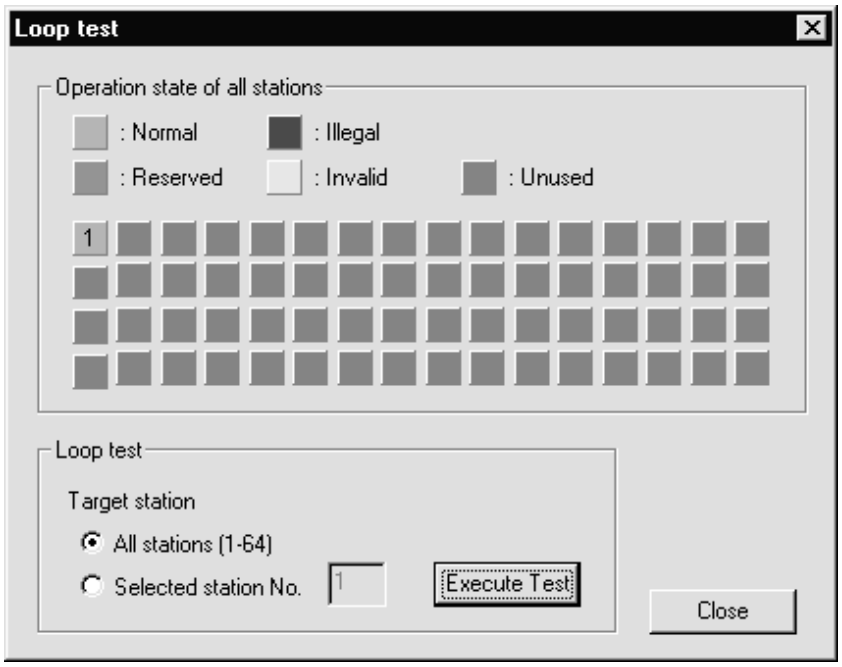
### (3) Loop test

Checks the operating status of the connected remote stations, local stations, intelligent device stations and standby master station.
Normal stations are displayed "blue", abnormal stations "red", reserved stations "green", error invalid stations "yellow", and unused stations "gray".

(a) Operating procedure

[Diagnostics] → [CC-Link / CC-Link/LT diagnostics]

1) Select "CC-Link" for "Module Setting".
2) Specify the target master module of loop test for "Module No." or "I/O Address".
3) Click the Start Monitoring button.
4) Click the Loop Test button.
5) When checking the communication status of all stations
   Select "All stations" for "Target station", and click the Execute Test button.
6) When checking the communication status of specific modules
   Select "Selected station No." for "Target station", specify the station number, and click the Execute Test button.




| POINT |
|---|
| When conducting a loop test, do not perform write to buffer memory addresses 5E0H, 608H. |


13 - 19

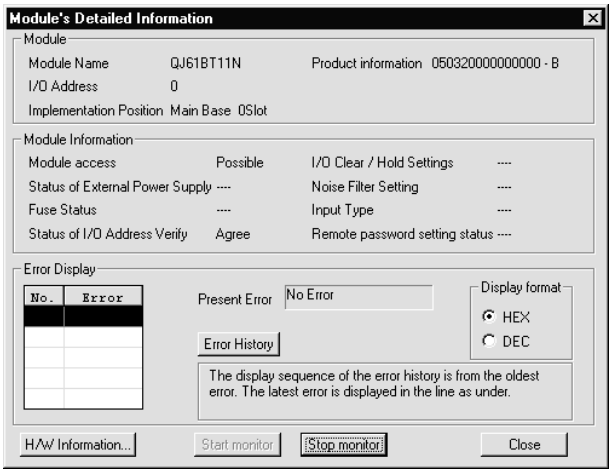
### (4) H/W Information

This function displays the operation and setting statuses of the master module, local modules, and standby master module.

(a) Operating procedure

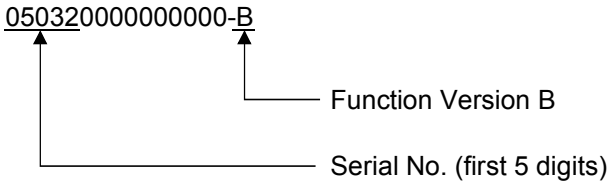
[Diagnostics] → [System monitor]

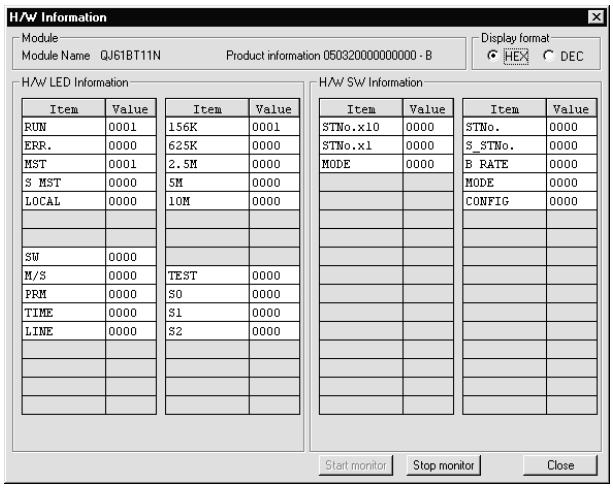
1) Select the QJ61BT11N.
2) Click the Module Detailed Information button.
3) Click the H/W Information button.




(b) Product information

The function version and serial No. are displayed as follows.






(c) H/W LED Information

The H/W LED Information displays the following data link information.

| Item | Value |
|---|---|
| RUN | 1: When the module is operating normally<br>0: At watchdog timer error |
| ERR. | 1: All stations are faulty<br>Switching between 0 and 1: There is a faulty station |
| MST | 1: Set to the master station |
| S MST | 1: Set to the standby master station |
| LOCAL | 1: Set to a local station |
| SW | 1: Error in switch setting |
| M/S | 1: A master station already exists on the same line |
| PRM | 1: There is an error in the parameter contents |
| TIME | 1: The data link monitoring timer was activated |
| LINE | 1: The cable is broken or the transmission path is affected by noise, etc. |
| 156K | 1: A transmission speed of 156 kbps is selected |
| 625K | 1: A transmission speed of 625 kbps is selected |
| 2.5M | 1: A transmission speed of 2.5 Mbps is selected |
| 5M | 1: A transmission speed of 5 Mbps is selected |
| 10M | 1: A transmission speed of 10 Mbps is selected |
| TEST | 1: An offline test is being executed |
| S0 | Not used |
| S1 | Not used |
| S2 | Not used |

(d) H/W SW Information

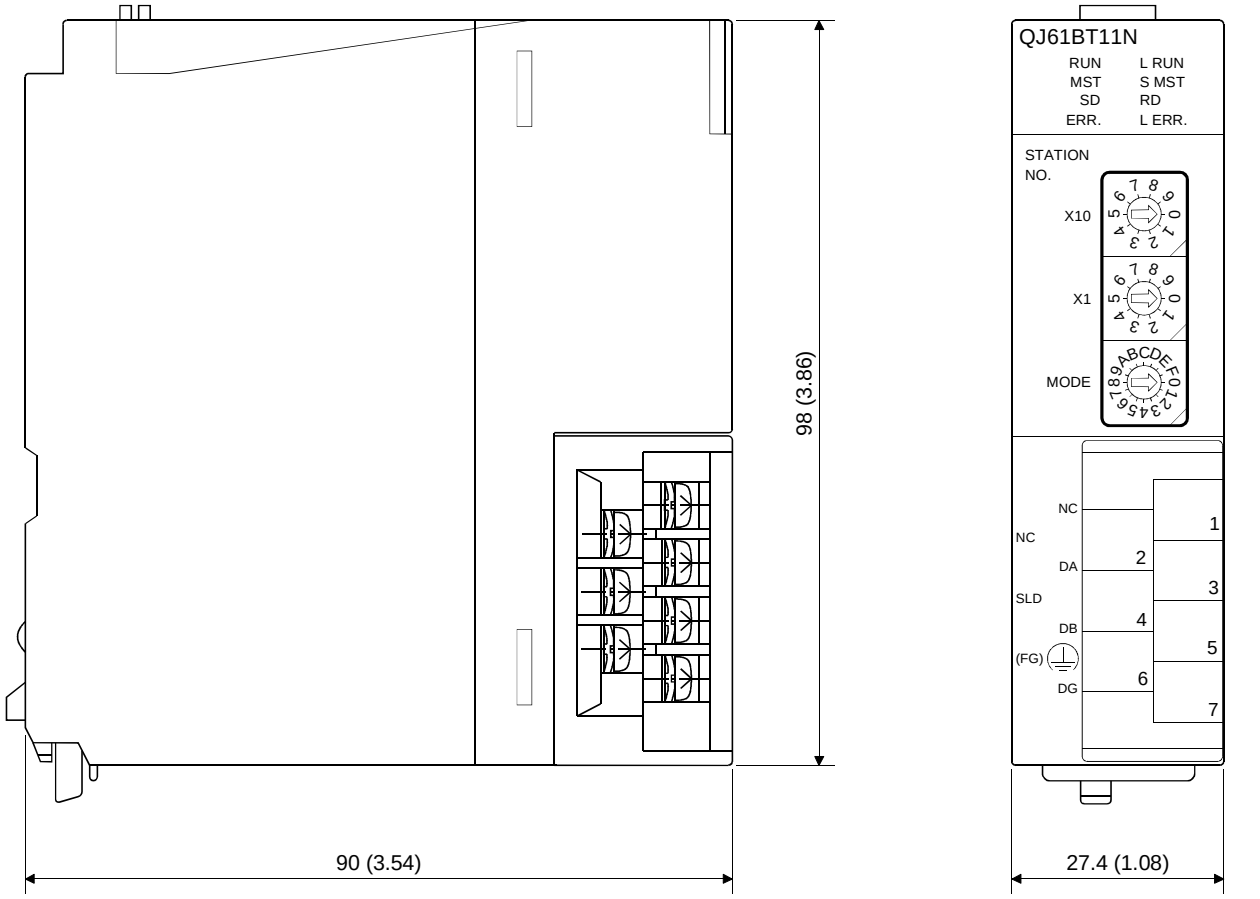
The H/W SW Information displays the following information.

| Item | Value |
|---|---|
| STNo.x10 | Setting value of station number setting switch X10 |
| STNo.x1 | Setting value of station number setting switch X1 |
| MODE | Setting values of transmission speed and mode setting switches |
| STNo. | Station number of relevant module when the power supply is turned on |
| S MSTNo. | Station number of the standby master station set by parameter<br>(0: No standby master station specification) |
| B RATE | Setting of transmission speed |
| MODE | Mode setting status |
| CONFIG | SW62 (module operation status) |

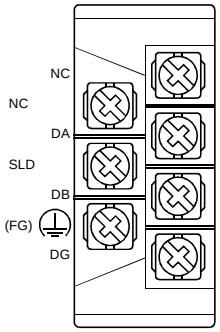
# APPENDIX

## Appendix 1 External Dimensions Diagram

This section describes the external dimensions of the QJ61BT11N.




[Terminal block diagram with the cover open]




Unit: mm (inch)


App - 1

## Appendix 2 Dedicated Instruction List

Transient transmission can be performed for the local stations and intelligent device stations using dedicated instructions.
The following table lists the dedicated instructions that can be used for each of these stations:

| Target station | Instruction | Description | Reference page |
|---|---|---|---|
| Master station<br>Local station | RIRD | Reads data from the buffer memory or the PLC CPU device of the specified station. | Appendix 2.1 |
| | RIWT | Writes data into the buffer memory or the PLC CPU device of the specified station. | Appendix 2.2 |
| Intelligent device station | RIRD | Reads data from the buffer memory of the specified station. | Appendix 2.1 |
| | RIWT | Writes data into the buffer memory of the specified station. | Appendix 2.2 |
| | RIRCV | Automatically performs handshaking with the specified station and reads data from the buffer memory of that station.<br>Available for modules that have handshake signals (e.g. AJ65BT-R2). | Appendix 2.3 |
| | RISEND | Automatically performs handshaking with the specified station and writes data into the buffer memory of that station.<br>Available for modules that have handshake signals (e.g. AJ65BT-R2). | Appendix 2.4 |
| | RIFR | Reads data in the automatic update buffer of the specified station.<br>Available for modules that have the automatic update buffer (e.g. AJ65BT-R2). | Appendix 2.5 |
| | RITO | Writes data into the automatic update buffer of the specified station.<br>Available for modules that have the automatic update buffer (e.g. AJ65BT-R2). | Appendix 2.6 |
| Master station | RLPASET | Sets the network parameters for the master station and starts up the data link. | Appendix 2.7 |

**POINT**

Execute the dedicated instructions while the data link is being performed.
If any of the dedicated instructions is executed offline, no error will occur, but the execution of the dedicated instruction will not be completed.

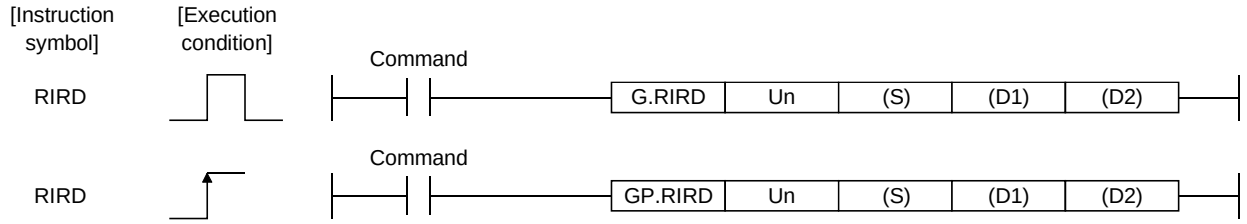
App.


App - 2

## Appendix 2.1 RIRD instruction

The RIRD instruction reads the data for the specified points from the buffer memory or the PLC CPU device of the specified station.

| Set data | Usable devices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Internal device (System, user) | | File register | MELSECNET/H Direct J□\□ | | Special function module U□\G□ | Index register Z□ | Constant | | Other |
| | Bit | Word | | Bit | Word | | | K, H | S | |
| (S) | — | ○ | | — | | | | — | — | — |
| (D1) | — | ○ | | — | | | | — | — | — |
| (D2) | ○ | | | — | | | | — | — | — |

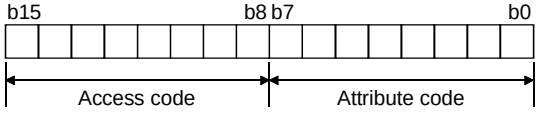



### Set data

| Device | Description | Setting range | Data type |
|---|---|---|---|
| Un | Start I/O number of the module | 0 to FEH | Binary 16 bits |
| (S) | Start number of the device in which control data is stored. | Within the range of the specified device | Device name |
| (D1) | Start number of the device to which read data is to be stored. | Within the range of the specified device | |
| (D2) | Device that is turned ON for one scan upon completion of reading.<br>(D2) + 1 also turns ON at an abnormal completion. | Within the range of the specified device | Bit |

* The file register of each of the local device and the program cannot be used as a device for setting data.

### Control data

| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S) + 0 | Completion status | Stores the status when the instruction is complete.<br>0 : No error (normal completion)<br>Other than 0: Error code | — | System |
| (S) + 1 | Station number | Specify the station numbers of the local station and intelligent device station. | 0 to 64 | User |
| (S) + 2 | Access code<br>Attribute code |  | See (1) and (2). | User |
| (S) + 3 | Buffer memory address or device number | Specify the buffer memory start address or device start number. | *1 | User |
| (S) + 4 | Number of points to read | Specify the read data count (in word units). | 1 to 480 *2<br>1 to 32 *3 | User |


App - 3

∗1: See the manual for the local station or the intelligent device station from which data will be read. When the random access buffer is specified, specify the addresses by setting the start address of the random access buffer memory as 0.
∗2: Indicates the maximum number of data items that can be read.
Specify the buffer memory size of the local station or the intelligent device station. Also, specify the receive buffer area setting range to be set with a parameter.
∗3: When the counterpart PLC CPU is other than QCPU (Q mode)/QCPU (A mode)/ QnACPU/AnUCPU and reads the PLC CPU device, the setting range will be 1 to 32 words.

### (1) Buffer memory in the CC-Link

| Buffer Memory contents | | Access code | Attribute code |
|---|---|---|---|
| Buffer in the intelligent device station | | 00H | 04H |
| Buffers in master station and local station | Random access buffer | 20H | |
| | Remote input | 21H | |
| | Remote output | 22H | |
| | Remote register | 24H | |
| | Link special relay | 63H | |
| | Link special register | 64H | |

### (2) Device memory in the PLC CPU

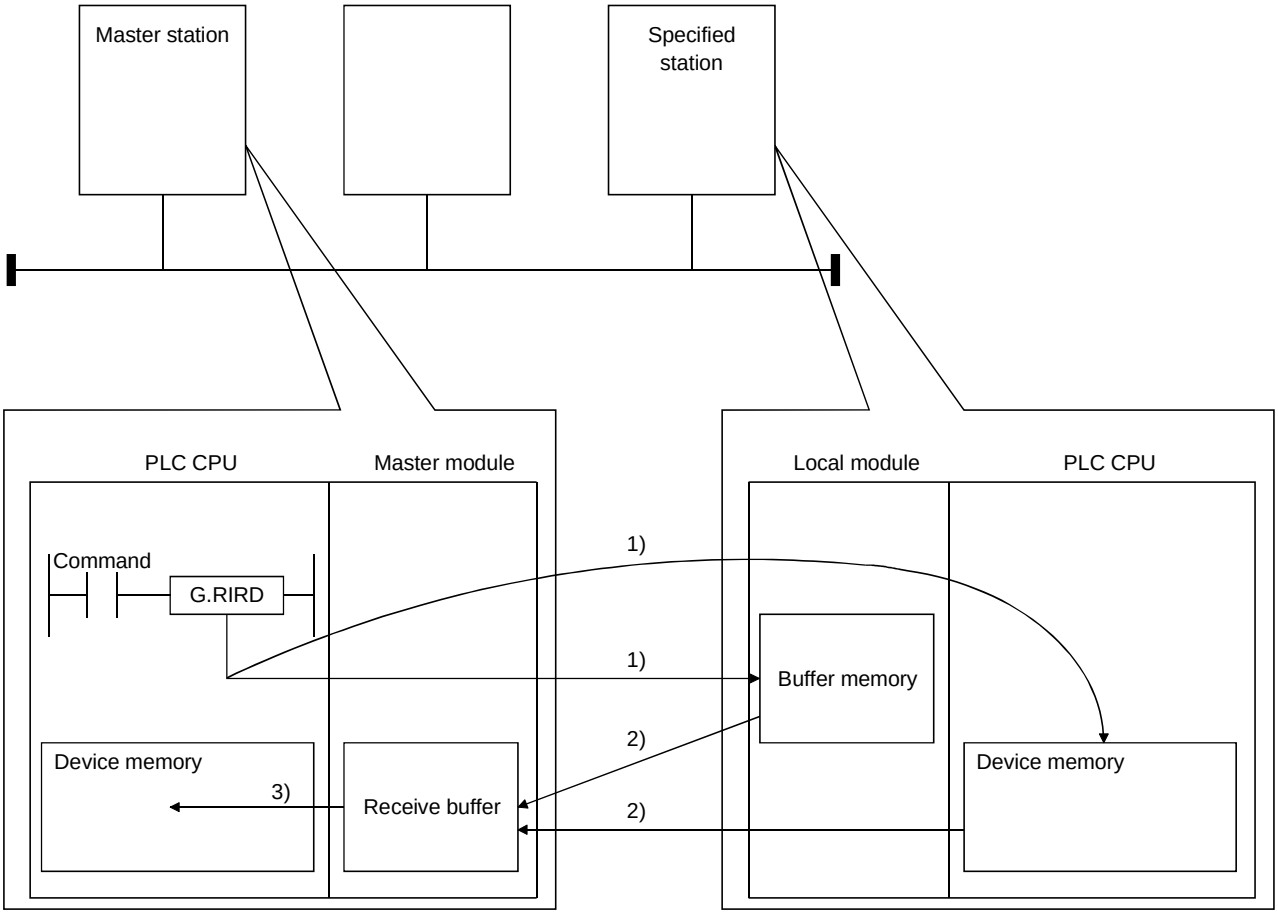
| Device contents | Name | Device type | | Unit | Access code | Attribute code |
|---|---|---|---|---|---|---|
| | | Bit | Word | | | |
| Input relay | X | ○ | | Hexadecimal | 01H | 05H |
| Output relay | Y | ○ | | Hexadecimal | 02H | |
| Internal relay | M | ○ | | Decimal | 03H | |
| Latch relay | L | ○ | | Decimal | 83H | |
| Link relay | B | ○ | | Hexadecimal | 23H | |
| Timer (contact) | T | ○ | | Decimal | 09H | |
| Timer (coil) | T | ○ | | Decimal | 0AH | |
| Timer (present value) | T | | ○ | Decimal | 0CH | |
| Retentive timer (contact) | ST | ○ | | Decimal | 89H | |
| Retentive timer (coil) | ST | ○ | | Decimal | 8AH | |
| Retentive timer (present value) | ST | | ○ | Decimal | 8CH | |
| Counter (contact) | C | ○ | | Decimal | 11H | |
| Counter (coil) | C | ○ | | Decimal | 12H | |
| Counter (present value) | C | | ○ | Decimal | 14H | |
| Data register | D | | ○ | Decimal | 04H | |
| Link register | W | | ○ | Hexadecimal | 24H | |
| File register | R | | ○ | Decimal | 84H | |
| Special link relay | SB | ○ | | Hexadecimal | 63H | |
| Special link register | SW | | ○ | Hexadecimal | 64H | |
| Special relay | SM | ○ | | Decimal | 43H | |
| Special register | SD | | ○ | Decimal | 44H | |

∗ Devices other than shown above cannot be accessed.
When accessing a bit device, specify it with 0 or a multiple of 16.


App - 4

### (3) Functions

(a) Operation chart for the RIRD instruction



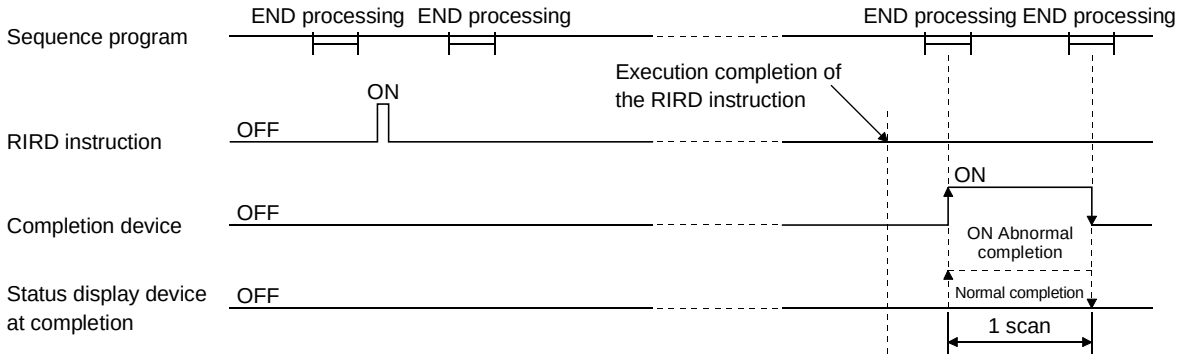

1) Accesses the buffer memory specified by (S)+2 and (S)+3 of the station specified by (S)+1, or the PLC CPU device.
2) Stores the data that has been read in the receive buffer of the master module.
3) Stores the data that has been read after the device specified in (D1), and the device specified by (D2) turns on.

(b) The RIRD instruction can be executed to multiple local stations or intelligent device stations simultaneously.
Note that concurrent execution of multiple instructions including other instructions for transient transmission (refer to Appendix 2) is not allowed to the same local station or intelligent device station.
Create a program in which a flag remains on until the instruction is completed.

(c) There are two types of interlock signals for the RIRD instruction: the completion device (D2) and status display device at completion (D2) + 1.

1) Completion device
Turns ON in the END processing of the scan where the RIRD instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion
Turns ON and OFF depending on the completion status of the RIRD instruction.
Normal completion : Stays OFF and does not change.
Abnormal completion: Turns ON in the END processing of the scan where the RIRD instruction is completed, and turns OFF in the next END processing.




(d) Multiple dedicated instructions cannot be executed for the same station.
Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON.
The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.

(e) The basic number of steps of the RIRD instruction is 8 steps.

(f) The receive buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

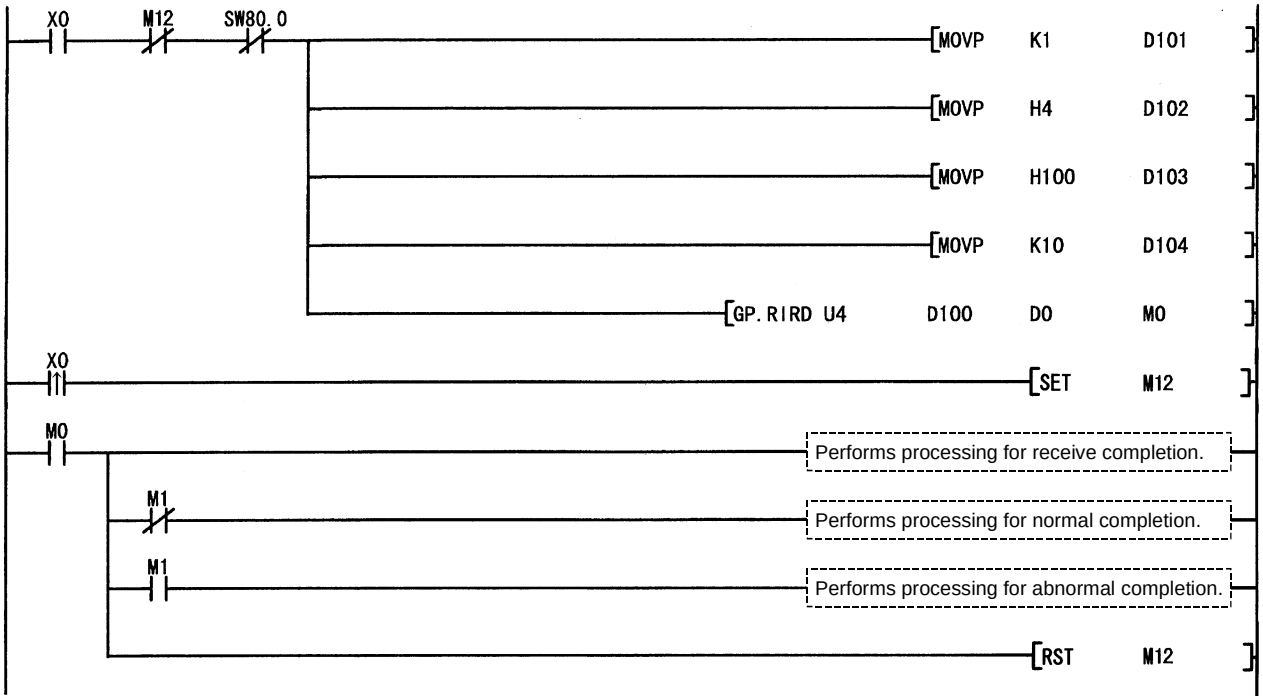
## (4) Operation error

In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

| Error code | Description of operation error |
|---|---|
| 2112 | When the module specified by Un is not an intelligent function module. |
| | When the module specified by Un is not a special function module. |
| 4002 | When an attempt was made to execute an unsupported instruction. |
| 4003 | When the number of devices in the instruction is incorrect. |
| 4004 | When the instruction specifies a device that cannot be used. |
| 4100 | When the instruction contains the data that cannot be used. |
| 4101 | When the number of data set to be used exceeds the allowable range.<br>Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range. |

(5) Program example

When X0 is turned ON, this program stores 10-word data to D0 and succeeding addresses from buffer memory address 100H of the intelligent device station number 1, which is connected to the master module installed at I/O numbers from X/Y40 to X/Y5F.
(When the link special register (SW) refresh device is set to SW0)
M12 is the RIRD instruction executing flag.



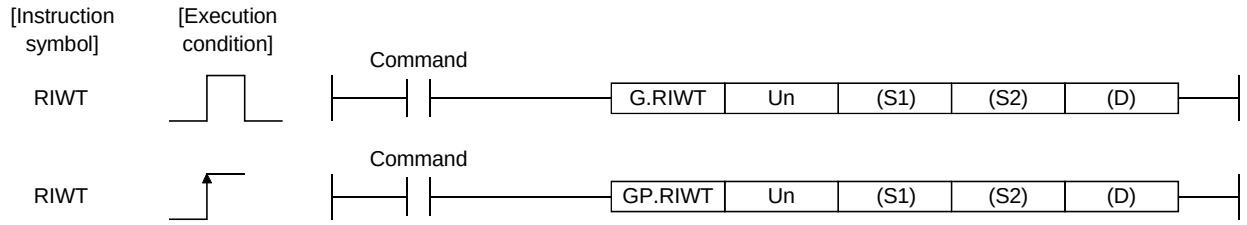


App - 7

## Appendix 2.2 RIWT instruction

The RIWT instruction writes the data for the specified points, to the buffer memory or the PLC CPU device of the specified station.

| Set data | Usable devices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Internal device (System, user) | | File register | MELSECNET/H Direct J□\□ | | Special function module U□\G□ | Index register Z□ | Constant | | Other |
| | Bit | Word | | Bit | Word | | | K, H | S | |
| (S1) | — | ○ | | — | | | | — | — | — |
| (S2) | — | ○ | | — | | | | — | — | — |
| (D) | ○ | | | — | | | | — | — | — |

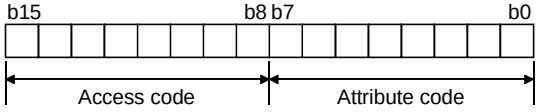



### Set data

| Device | Description | Setting range | Data type |
|---|---|---|---|
| Un | Start I/O number of the module | 0 to FEH | Binary 16 bits |
| (S1) | Start number of the device in which control data is stored. | Within the range of the specified device | Device name |
| (S2) | Start number of the device to which write data is to be stored. | Within the range of the specified device | |
| (D) | Device that is turned ON for one scan upon completion of writing.<br>(D) + 1 also turns ON at an abnormal completion. | Within the range of the specified device | Bit |

* The file register of each of the local device and the program cannot be used as a device for setting data.

### Control data

| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S1) + 0 | Completion status | Stores the status when the instruction is complete.<br>0 : No error (normal completion)<br>Other than 0: Error code | — | System |
| (S1) + 1 | Station number | Specify the station numbers of the local station and intelligent device station. | 0 to 64 | User |
| (S1) + 2 | Access code<br>Attribute code |  | See (1) and (2). | User |
| (S1) + 3 | Buffer memory address or device number | Specify the buffer memory start address or device start number. | *1 | User |
| (S1) + 4 | Number of points to write | Specify the write data count (in word units). | 1 to 480 *2<br>1 to 10 *3 | User |


App - 8

∗1: See the manual for the local station or the intelligent device station to which data will be written. When the random access buffer is specified, specify the addresses by setting the start address of the random access buffer memory as 0.
∗2: Indicates the maximum number of data items that can be written.
Specify the buffer memory capacity of the local station or the intelligent device station. Also, specify the send buffer area setting range to be set with a parameter.
∗3: When the counterpart PLC CPU is other than QCPU (Q mode)/QCPU (A mode)/ QnACPU/AnUCPU and writes the PLC CPU device, the setting range will be 1 to 10 words.

### (1) Buffer memory in the CC-Link

| Buffer Memory contents | | Access code | Attribute code |
|---|---|---|---|
| Buffer in the intelligent device station | | 00H | 04H |
| Buffers in master station and local station | Random access buffer | 20H | |
| | Remote input | 21H | |
| | Remote output | 22H | |
| | Remote register | 24H | |
| | Link special relay | 63H | |
| | Link special register | 64H | |

### (2) Device memory in the PLC CPU

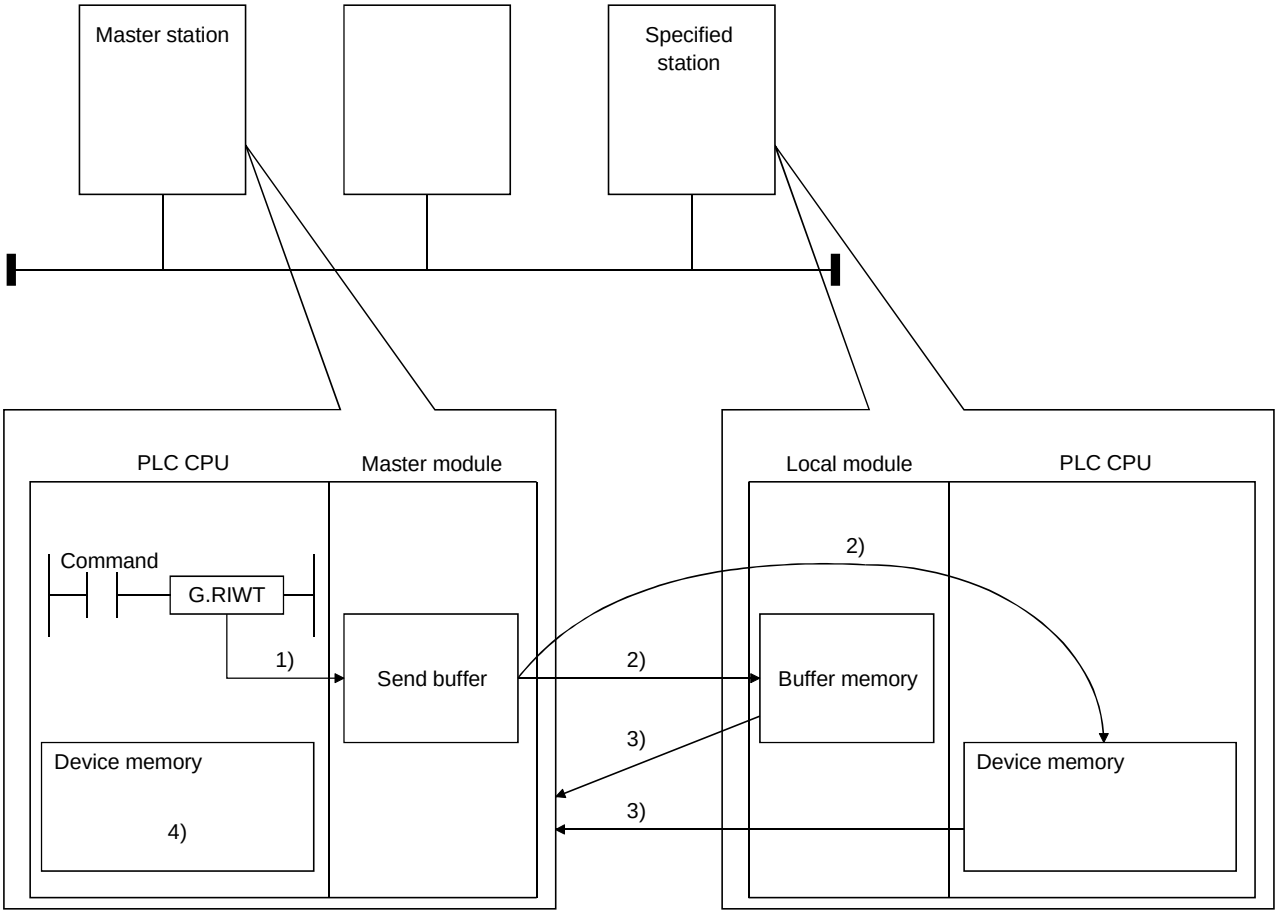
| Device contents | Name | Device type | | Unit | Access code | Attribute code |
|---|---|---|---|---|---|---|
| | | Bit | Word | | | |
| Input relay | X | ○ | | Hexadecimal | 01H | 05H |
| Output relay | Y | ○ | | Hexadecimal | 02H | |
| Internal relay | M | ○ | | Decimal | 03H | |
| Latch relay | L | ○ | | Decimal | 83H | |
| Link relay | B | ○ | | Hexadecimal | 23H | |
| Timer (contact) | T | ○ | | Decimal | 09H | |
| Timer (coil) | T | ○ | | Decimal | 0AH | |
| Timer (present value) | T | | ○ | Decimal | 0CH | |
| Retentive timer (contact) | ST | ○ | | Decimal | 89H | |
| Retentive timer (coil) | ST | ○ | | Decimal | 8AH | |
| Retentive timer (present value) | ST | | ○ | Decimal | 8CH | |
| Counter (contact) | C | ○ | | Decimal | 11H | |
| Counter (coil) | C | ○ | | Decimal | 12H | |
| Counter (present value) | C | | ○ | Decimal | 14H | |
| Data register | D | | ○ | Decimal | 04H | |
| Link register | W | | ○ | Hexadecimal | 24H | |
| File register | R | | ○ | Decimal | 84H | |
| Special link relay | SB | ○ | | Hexadecimal | 63H | |
| Special link register | SW | | ○ | Hexadecimal | 64H | |
| Special relay | SM | ○ | | Decimal | 43H | |
| Special register | SD | | ○ | Decimal | 44H | |

∗ Devices other than shown above cannot be accessed.
When accessing a bit device, specify it with 0 or a multiple of 16.


App - 9

(3) Functions

(a) Operation chart for the RIWT instruction



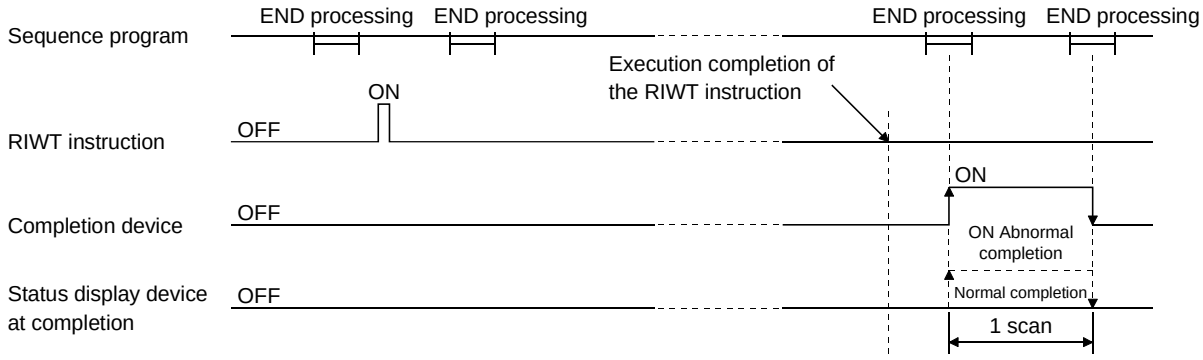

1) Stores the data to be written to the specified station in the send buffer of the master module.
2) Writes the data specified by (S2) to the buffer memory specified by (S1)+2 and (S1)+3 of the station specified by (S1)+1 or to the PLC CPU device.
3) The specified station returns the write complete response to the master station.
4) The device specified by (D) turns ON.

(b) The RIWT instruction can be executed to multiple local stations or intelligent device stations simultaneously.
Note that concurrent execution of multiple instructions including other instructions for transient transmission (refer to Appendix 2) is not allowed to the same local station or intelligent device station.
Create a program in which a flag remains on until the instruction is completed.

(c) There are two types of interlock signals for the RIWT instruction: the completion device (D) and the status display device at completion (D) + 1.

1) Completion device
Turns ON in the END processing of the scan where the RIWT instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion
Turns ON and OFF depending on the completion status of the RIWT instruction.
Normal completion : Stays OFF and does not change.
Abnormal completion: Turns ON in the END processing of the scan where the RIWT instruction is completed, and turns OFF in the next END processing.




(d) Multiple dedicated instructions cannot be executed for the same station.
Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON.
The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.

(e) The basic number of steps of the RIWT instruction is 8 steps.

(f) The send buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

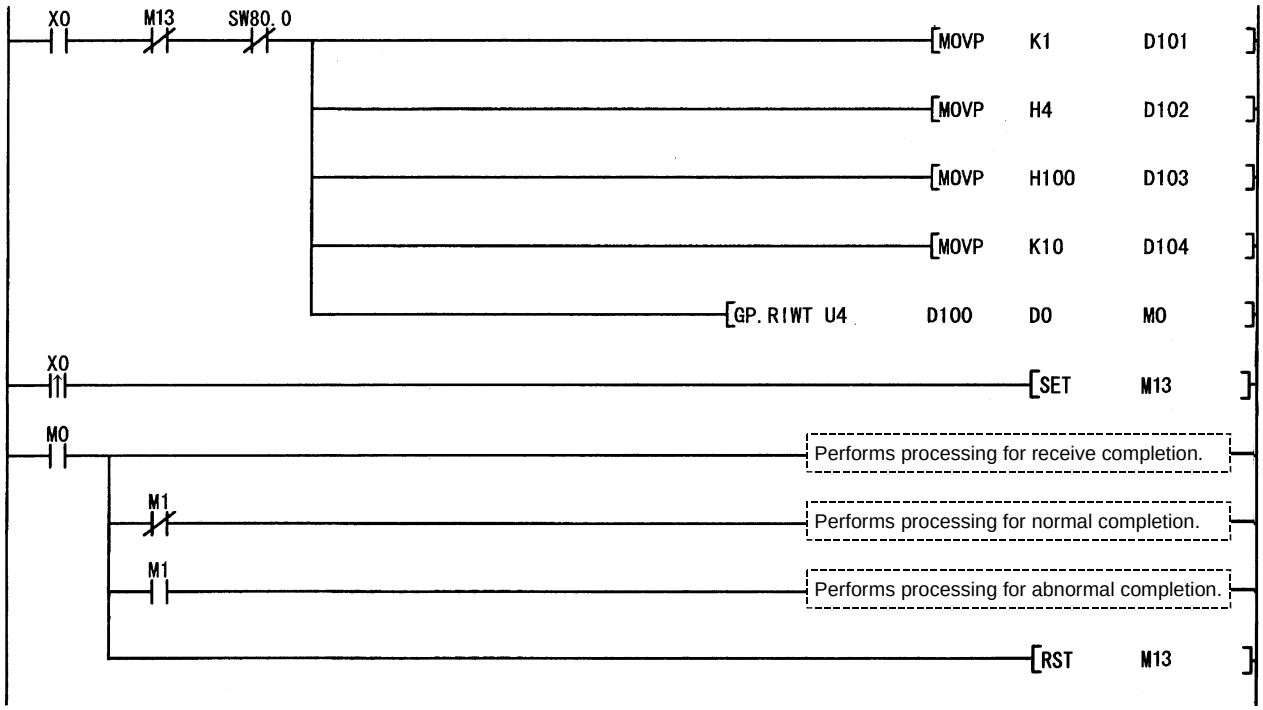
## (4) Operation error

In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

| Error code | Description of operation error |
|---|---|
| 2112 | When the module specified by Un is not an intelligent function module. |
| | When the module specified by Un is not a special function module. |
| 4002 | When an attempt was made to execute an unsupported instruction. |
| 4003 | When the number of devices in the instruction is incorrect. |
| 4004 | When the instruction specifies a device that cannot be used. |
| 4100 | When the instruction contains the data that cannot be used. |
| 4101 | When the number of data set to be used exceeds the allowable range.<br>Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range. |

(5) Program example

When X0 is turned ON, this program stores 10-word data from D0 to buffer memory address 100H and succeeding addresses of the intelligent device station number 1, which is connected to the master module installed at I/O numbers from X/Y40 to X/Y5F.
(When the link special register (SW) refresh device is set to SW0)
M13 is the RIWT instruction executing flag.



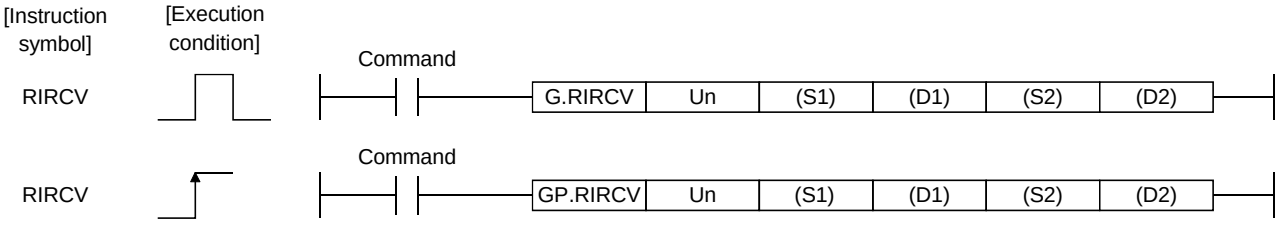


App - 12

## Appendix 2.3 RIRCV instruction

The RIRCV instruction automatically performs handshaking with an intelligent device station and reads data from the buffer memory of the specified intelligent device station. Available for modules that have handshake signals (e.g. AJ65BT-R2).

| Set data | Usable devices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Internal device (System, user) | | File register | MELSECNET/H Direct J□\□ | | Special function module U□\G□ | Index register Z□ | Constant | | Other |
| | Bit | Word | | Bit | Word | | | K, H | S | |
| (S1) | — | ○ | | — | | | | — | — | — |
| (D1) | — | ○ | | — | | | | — | — | — |
| (S2) | — | ○ | | — | | | | — | — | — |
| (D2) | ○ | | | — | | | | — | — | — |




### Set data

| Device | Description | Setting range | Data type |
|---|---|---|---|
| Un | Start I/O number of the module | 0 to FEH | Binary 16 bits |
| (S1) | Start number of the device in which control data is stored. | Within the range of the specified device | Device name |
| (D1) | Start number of the device to which read data is to be stored. | Within the range of the specified device | |
| (S2) | Start number of the device in which the interlock signals are stored. | Within the range of the specified device | |
| (D2) | Device that is turned ON for one scan upon completion of reading. (D2)+1 also turns ON at an abnormal completion. | Within the range of the specified device | Bit |

* The file register of each of the local device and the program cannot be used as a device for setting data.

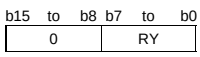
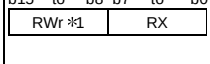
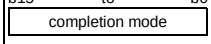
### Control data

| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S1) + 0 | Completion status | Stores the status when the instruction is complete.<br>0 : No error (normal completion)<br>Other than 0: Error code | — | System |
| (S1) + 1 | Station number | Specify the station number of the intelligent device station. | 0 to 64 | User |
| (S1) + 2 | Access code<br>Attribute code | Set "0004H". | 0004H | User |
| (S1) + 3 | Buffer memory address | Specify the buffer memory start address. | *1 | User |
| (S1) + 4 | Number of points to read | Specify the read data count (in word units). | 1 to 480 *2 | User |

*1: See the manual for the intelligent device station from which data will be read.

*2: Indicates the maximum number of data items that can be read.
Specify the buffer memory capacities of the intelligent device station and the receive buffer area setting range to be set with a parameter.

## Interlock signal storage devices

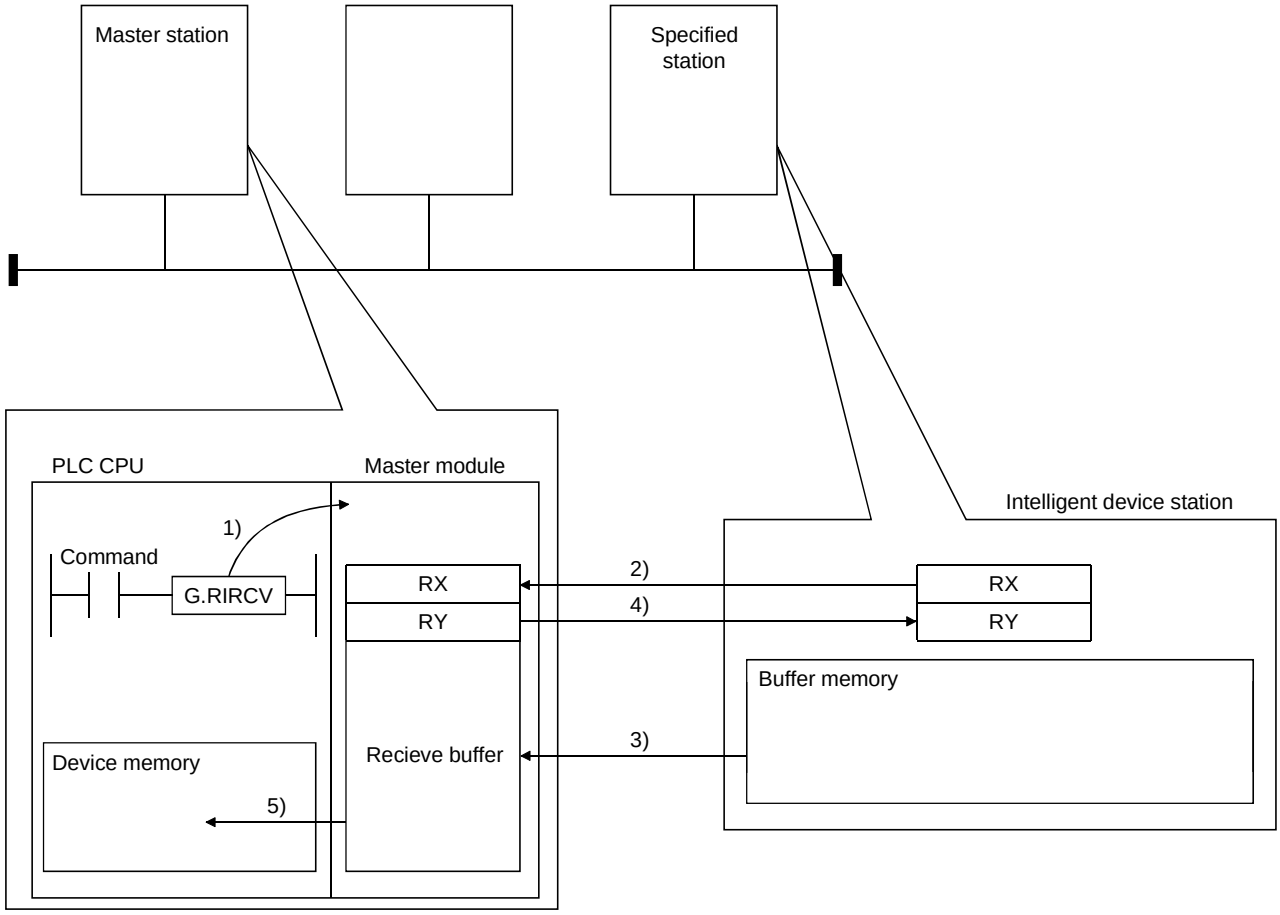
| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S2) + 0 |  | RY: Request device | 0 to 127 | User |
| | | Set the upper 8 bits to 0. | 0 | User |
| (S2) + 1 |  | RX : Completion device | 0 to 127 | User |
| | | RWr : Error code storage device<br>If none, set to FFH. | 0 to 15<br>FFH | User |
| (S2) + 2 |  | 0: Complete with the contents of 1 device (RXn).<br>1: Complete with the contents of 2 devices (RXn and RXn+1).<br>(RXn+1 turns ON at an abnormal completion.) | 0/1 | User |

*1: The same error code as that for the control data completion status is stored in the error code storage device.


App - 14

## (1) Functions

### (a) Operation chart for the RIRCV instruction



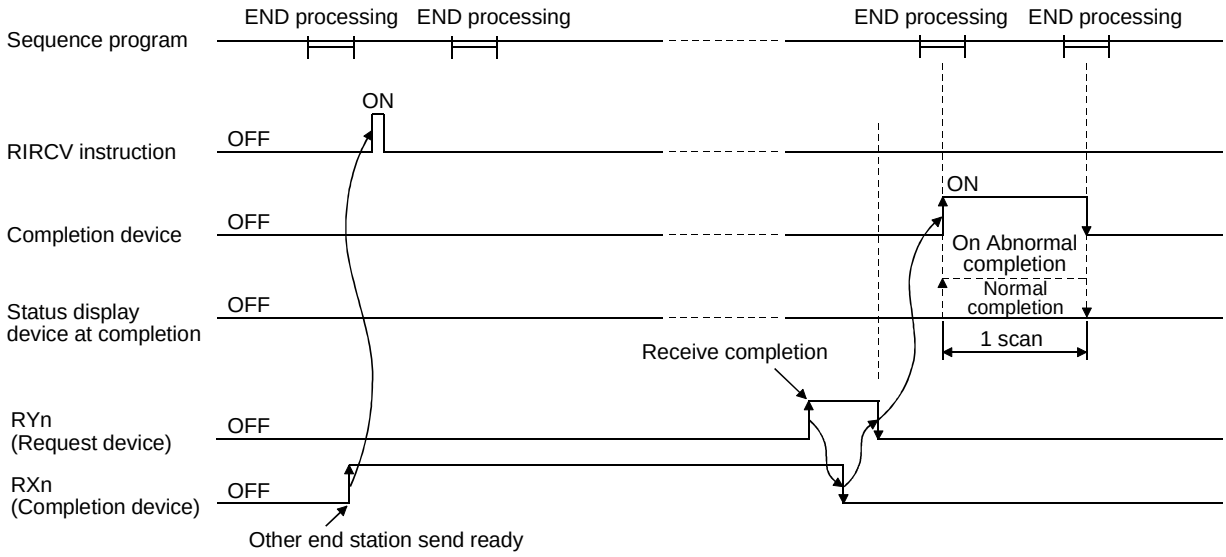

1) Instructs the master module to read data from the buffer memory specified in (S1)+2 and (S1)+3 of the station specified in (S1)+1.
2) The master module monitors the remote input (RX) specified in (S2)+1.
3) When the remote input (RX) specified in (S2)+1 turns ON from OFF, the master module reads data from the buffer memory of the specified station.
   Read data are stored in the receive buffer of the master module.
4) The master module turns the remote output (RY) specified in (S2)+0 ON.
   When the remote input specified in (S)+1 turns OFF from ON, the remote output specified in (S2)+0 turns OFF.
5) Data read out from the specified station are stored in the device specified in (D1) and subsequent devices, and a device specified in D2 turns ON.

(b) The RIRCV instruction can be executed to multiple intelligent device stations simultaneously.
Note that concurrent execution of multiple instructions including other instructions for transient transmission (refer to Appendix 2) is not allowed to the same intelligent device station.
Create a program in which a flag remains on until the instruction is completed.

(c) There are two types of interlock signals for the RIRCV instruction: the completion device (D2) and the status display device at completion (D2)+1.

1) Completion device
Turns ON in the END processing of the scan where the RIRCV instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion
Turns ON and OFF depending on the completion status of the RIRCV instruction.
Normal completion: Stays OFF and does not change.
Abnormal completion: Turns ON in the END processing of the scan where the RIRCV instruction is completed, and turns OFF in the next END processing.




(d) Multiple dedicated instructions cannot be executed for the same station.
Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON.
The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.

(e) The basic number of steps of the RIRCV instruction is 10 steps.

(f) The receive buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

### (2) Operation error

In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

| Error code | Description of operation error |
|---|---|
| 2112 | When the module specified by Un is not an intelligent function module. |
| | When the module specified by Un is not a special function module. |
| 4002 | When an attempt was made to execute an unsupported instruction. |
| 4003 | When the number of devices in the instruction is incorrect. |
| 4004 | When the instruction specifies a device that cannot be used. |
| 4100 | When the instruction contains the data that cannot be used. |
| 4101 | When the number of data set to be used exceeds the allowable range.<br>Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range. |

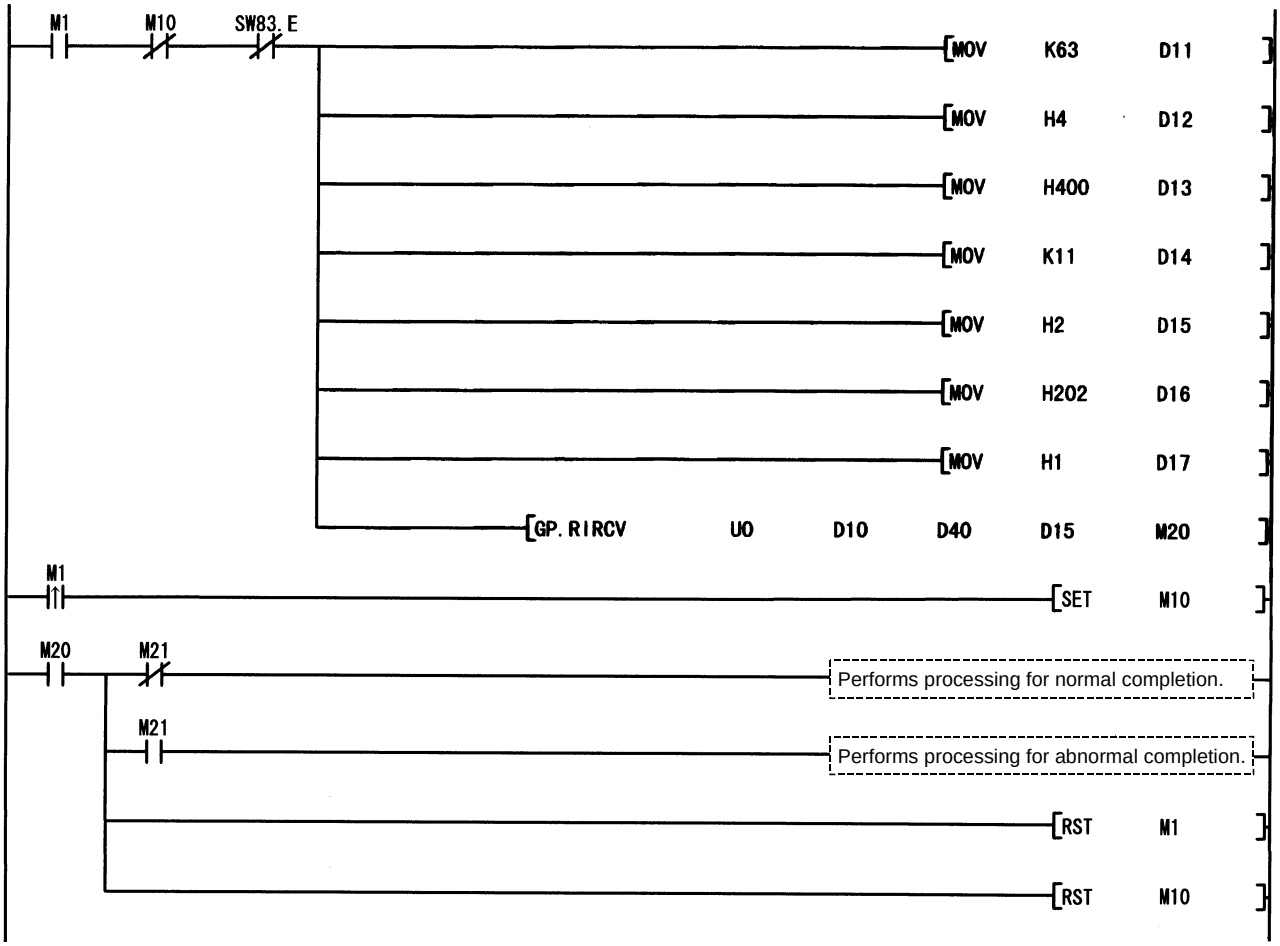
### (3) Program example

When M1 turns ON, 11-word data in the buffer memory address 400H and later of the intelligent device station No.63 (AJ65BT-R2), which is connected to the master module installed in the position of I/O No. X/Y00 to X/Y1F, are read out to the area starting from D40.

The settings of the interlock signal storage device are as follows: request device RY2, completion device RX2, error code storage device RWr2, and completion mode 1.

Also, set the link special register (SW) refresh device to SW0.

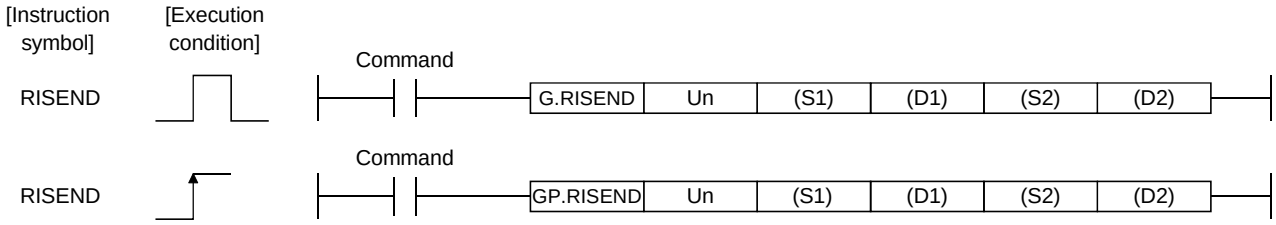
M10 is the RIRCV instruction executing flag.



## Appendix 2.4 RISEND instruction

The RISEND instruction automatically performs handshaking with an intelligent device station and writes data to the buffer memory of the specified intelligent device station. Available for modules that have handshake signals (e.g. AJ65BT-R2).

| Set data | Usable devices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Internal device (System, user) | | File register | MELSECNET/H Direct J□\□ | | Special function module U□\G□ | Index register Z□ | Constant | | Other |
| | Bit | Word | | Bit | Word | | | K, H | S | |
| (S1) | — | ○ | | — | | | | — | — | — |
| (D1) | — | ○ | | — | | | | — | — | — |
| (S2) | — | ○ | | — | | | | — | — | — |
| (D2) | ○ | | | — | | | | — | — | — |




### Set data

| Device | Description | Setting range | Data type |
|---|---|---|---|
| Un | Start I/O number of the module | 0 to FEH | Binary 16 bits |
| (S1) | Start number of the device in which control data is stored. | Within the range of the specified device | Device name |
| (D1) | Start number of the device to which write data is to be stored. | Within the range of the specified device | |
| (S2) | Start number of the device in which the interlock signals are stored. | Within the range of the specified device | Bit |
| (D2) | Device that is turned ON for one scan upon completion of writing. (D2)+1 also turns ON at an abnormal completion. | Within the range of the specified device | |

* The file register of each of the local device and the program cannot be used as a device for setting data.

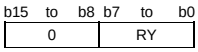
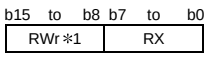
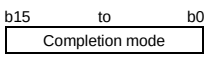
### Control data

| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S1) + 0 | Completion status | Stores the status when the instruction is complete.<br>0 : No error (normal completion)<br>Other than 0: Error code | — | System |
| (S1) + 1 | Station number | Specify the station number of the intelligent device station. | 0 to 64 | User |
| (S1) + 2 | Access code<br>Attribute code | Set "0004H". | 0004H | User |
| (S1) + 3 | Buffer memory address | Specify the buffer memory start address. | *1 | User |
| (S1) + 4 | Number of points write | Specify the write data count (in word units). | 1 to 480 *2 | User |

∗1: See the manual for the intelligent device station to which data will be written.

∗2: Indicates the maximum number of data items that can be written.
Specify the buffer memory capacities of the intelligent device station and the receive buffer area setting range to be set with a parameter.

## Interlock signal storage devices

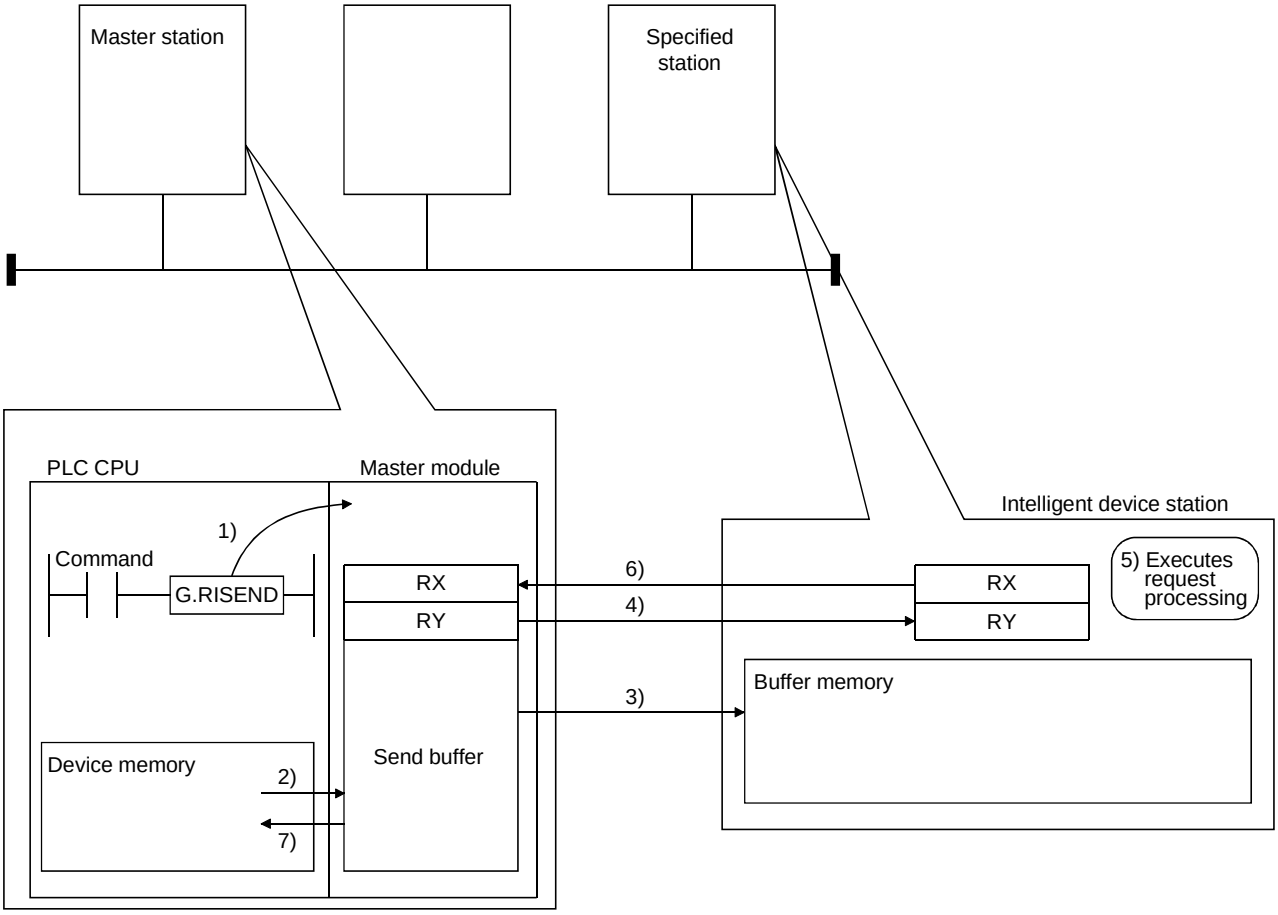
| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S2) + 0 |  | RY: Request device | 0 to 127 | User |
| | | Set the upper 8 bits to 0. | 0 | User |
| (S2) + 1 |  | RX : Completion device | 0 to 127 | User |
| | | RWr : Error code storage device<br>If none, set to FFH. | 0 to 15<br>FFH | User |
| (S2) + 2 |  | 0: Complete with the contents of 1 device (RXn).<br>1: Complete with the contents of 2 devices (RXn and RXn+1).<br>(RXn+1 turns ON at an abnormal completion.) | 0/1 | User |

∗1: The same error code as that for the control data completion status is stored in the error code storage device.


App - 19

(1) Functions

(a) Operation chart for the RISEND instruction



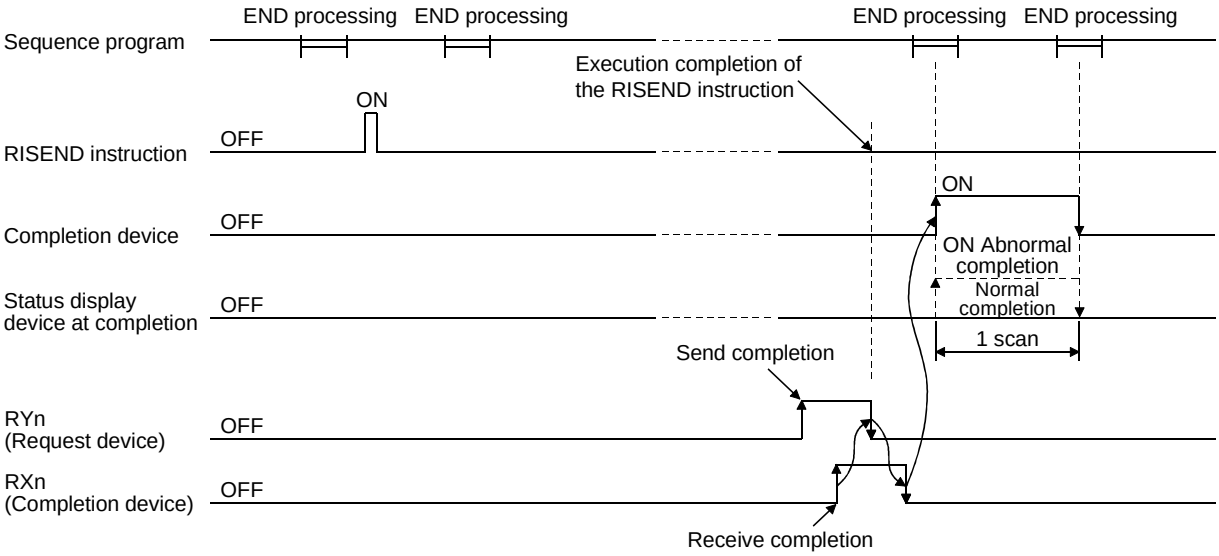

1) Instructs the master module to write data to the buffer memory specified in (S1)+2 and (S1)+3 of the station specified in (S1)+1.
2) Data to be written to the specified station are stored in the send buffer of the master module.
3) Data are written to the buffer memory specified in (S1)+2 and (S1)+3 of the station specified in (S1)+1.
4) The master module turns the remote output (RY) specified in (S2)+0 ON.
5) The station specified in (S1)+1 performs processing for the remote output (RY).
6) Upon completion of the processing for the remote output (RY), the station specified in (S1)+1 turns the remote input (RX) specified in (S2)+1 ON and the remote output (RY) specified in (S2)+0 turns OFF. Also, the response showing completion of write to the master module is returned.
7) The device specified in (D2) turns ON.

(b) The RISEND instruction can be executed to multiple intelligent device stations simultaneously.
Note that concurrent execution of multiple instructions including other instructions for transient transmission (refer to Appendix 2) is not allowed to the same intelligent device station. Create a program in which a flag remains on until the instruction is completed.

(c) There are two types of interlock signals for the RISEND instruction: the completion device (D2) and the status display device at completion (D2)+1.

1) Completion device
Turns ON in the END processing of the scan where the RISEND instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion
Turns ON and OFF depending on the completion status of the RISEND instruction.
Normal completion : Stays OFF and does not change.
Abnormal completion: Turns ON in the END processing of the scan where the RISEND instruction is completed, and turns OFF in the next END processing.




(d) Multiple dedicated instructions cannot be executed for the same station.
Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON.
The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.

(e) The basic number of steps of the RISEND instruction is 10 steps.

(f) The send buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

(2) Operation error

In the following cases, operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

| Error code | Description of operation error |
|---|---|
| 2112 | When the module specified by Un is not an intelligent function module. |
| | When the module specified by Un is not a special function module. |
| 4002 | When an attempt was made to execute an unsupported instruction. |
| 4003 | When the number of devices in the instruction is incorrect. |
| 4004 | When the instruction specifies a device that cannot be used. |
| 4100 | When the instruction contains the data that cannot be used. |
| 4101 | When the number of data set to be used exceeds the allowable range.<br>Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range. |

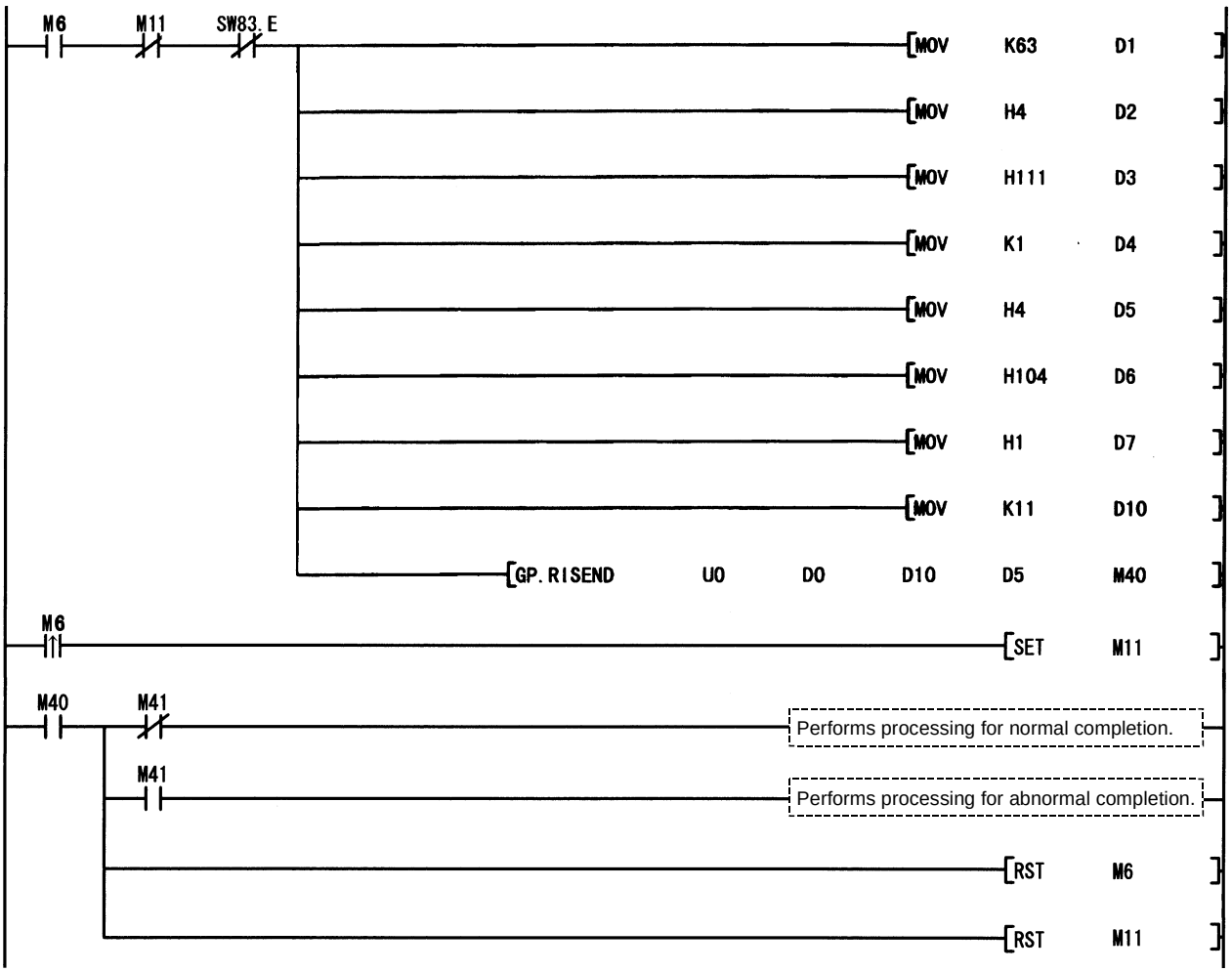
(3) Program example

When M6 turns ON, 1-word data are written to D10 from the buffer memory address 111H of the intelligent device station No.63 (AJ65BT-R2), which is connected to the master module installed in the position of I/O No. X/Y00 to X/Y1F.

The settings of the interlock signal storage device are as follows: request device RY4, completion device RX4, error code storage device RWr1, and completion mode 1.

Also, set the link special register (SW) refresh device to SW0.

M11 is the RISEND instruction executing flag.



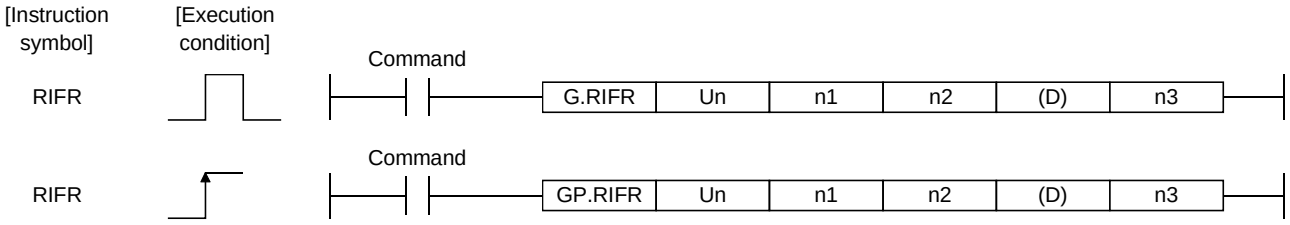


App - 22

## Appendix 2.5 RIFR instruction

The RIFR instruction reads the data from the automatic update buffer of the specified station.
Available for modules that have the automatic update buffer (e.g. AJ65BT-R2).

| Set data | Usable devices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Internal device (System, user) | | File register | MELSECNET/H Direct J□\□ | | Special function module U□\G□ | Index register Z□ | Constant | | Other |
| | Bit | Word | | Bit | Word | | | K, H | S | |
| n1 | ○ | ○ | | — | | | | ○ | — | — |
| n2 | ○ | ○ | | — | | | | ○ | — | — |
| (D) | — | ○ | | — | | | | — | — | — |
| n3 | ○ | ○ | | — | | | | ○ | — | — |




### Set data

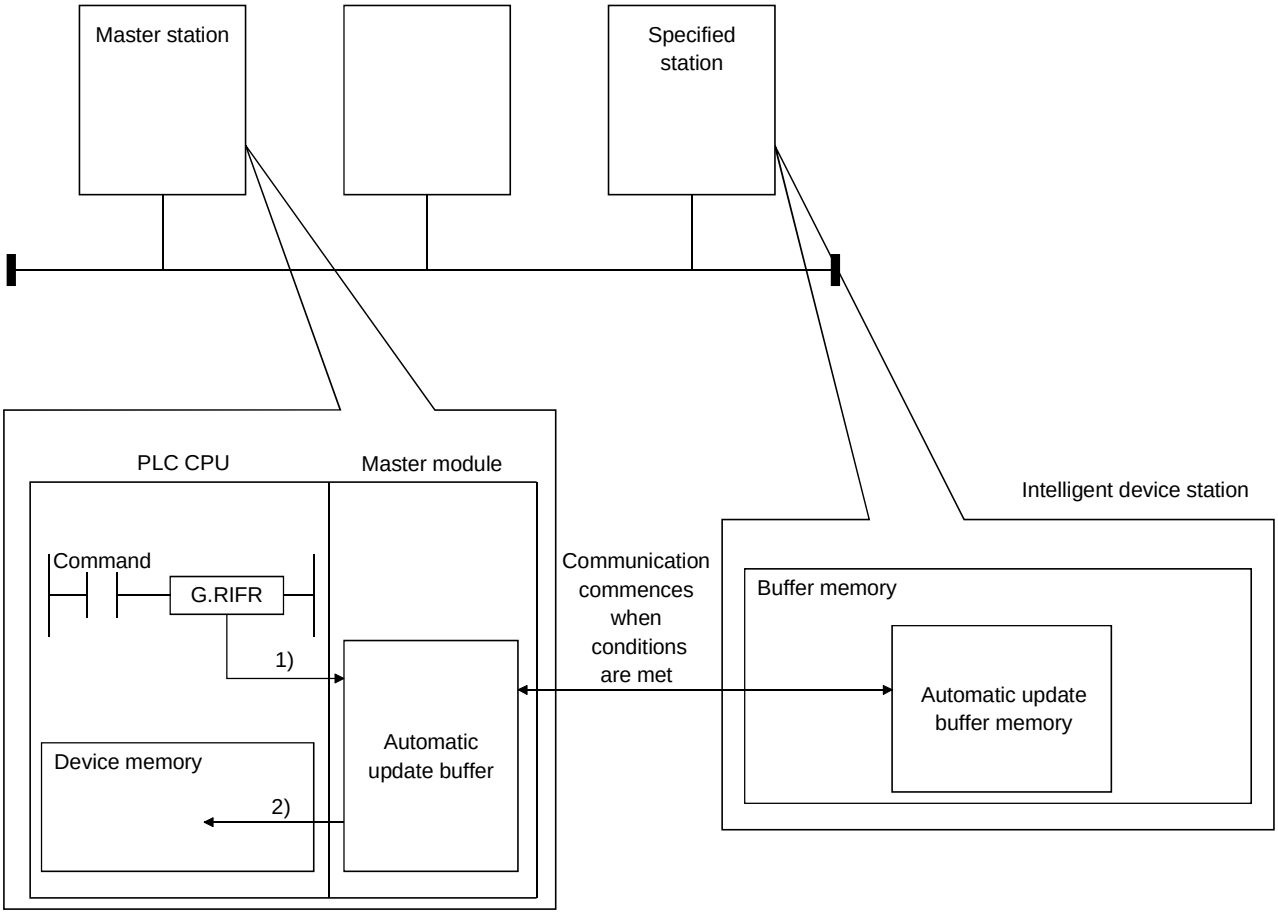
| Device | Description | Setting range | Data type |
|---|---|---|---|
| Un | Start I/O number of the module | 0 to FE$_H$ | Binary 16 bits |
| n1 | Intelligent device station number | 1 to 64 | |
| | Random access buffer specification | FF$_H$ | |
| n2 | The offset value of the automatic update buffer of the intelligent device station specified by the master station or the random access buffer. | Between 0 and parameter setting value ＊1 | |
| (D) | Start number of the device to which read data is to be stored. | Within the range of the specified device | Device |
| n3 | Number of points to read | 0 to 4096 ＊2 | Binary 16 bits |

＊1: The value set in the station information settings of the network parameters of the GX Developer.
＊2: No processing will be performed when set to "0".


App - 23

(1) Functions

(a) Operation chart for the RIFR instruction




1) Accesses the automatic update buffer specified by n1 and n2 of the master module specified by Un.
2) Stores the data read after the device specified by (D).

(b) The RIFR instruction reads data when it is executed.
However, this instruction cannot be executed simultaneously at more than one location for the same intelligent device station.

(c) The maximum points that can be read by the RIFR instruction are 4096.

(d) The basic number of steps of the RIFR instruction is 9 steps.

(e) The automatic update buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer.
For more details, see Section 6.2.

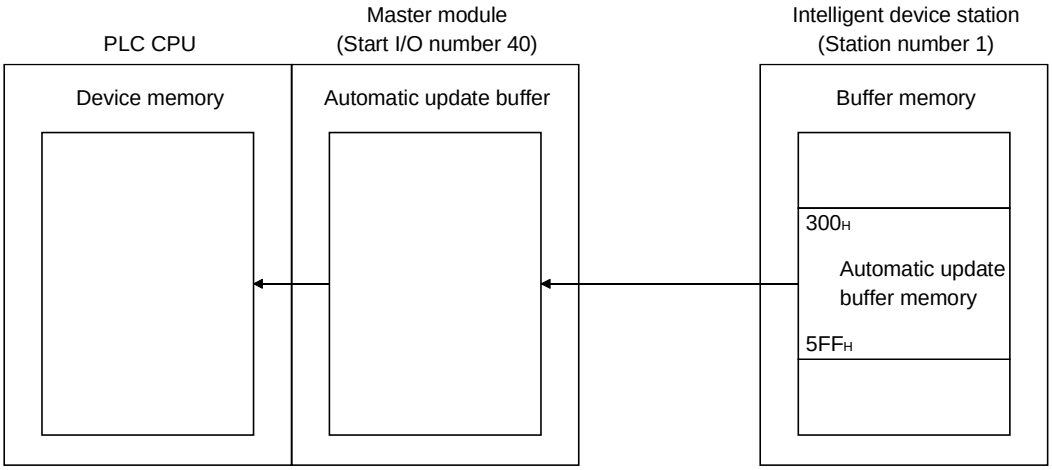

App - 24

## (2) Operation error

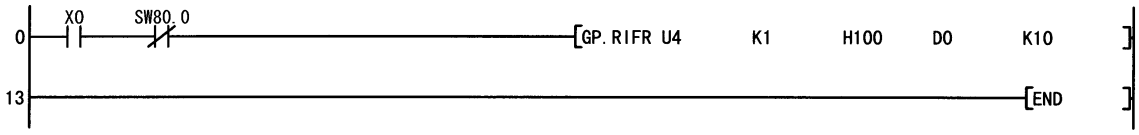
In the following cases, operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

| Error code | Description of operation error |
|---|---|
| 2112 | When the module specified by Un is not an intelligent function module. |
| | When the module specified by Un is not a special function module. |
| 4002 | When an attempt was made to execute an unsupported instruction. |
| 4003 | When the number of devices in the instruction is incorrect. |
| 4004 | When the instruction specifies a device that cannot be used. |
| 4100 | When the setting for number of points to read (n3) is outside of the setting range. |
| | When the station number specified with n1 does not exist. |

## (3) Program example




When X0 is turned ON, the following example program reads 10-word data to D0 or succeeding addresses from the automatic update buffer offset value of 100 ($400_H$ of the intelligent device station) in the master module.
(When the link special register (SW) refresh device is set to SW0)



## Appendix 2.6 RITO instruction

The RITO instruction writes data to the automatic update buffer of the specified station.
Available for modules that have the automatic update buffer (e.g. AJ65BT-R2).

| Set data | Usable devices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Internal device (System, user) | | File register | MELSECNET/H Direct J□\□ | | Special function module U□\G□ | Index register Z□ | Constant | | Other |
| | Bit | Word | | Bit | Word | | | K, H | S | |
| n1 | ○ | ○ | | — | | | | ○ | — | — |
| n2 | ○ | ○ | | — | | | | ○ | — | — |
| (D) | — | ○ | | — | | | | — | — | — |
| n3 | ○ | ○ | | — | | | | ○ | — | — |

### Set data

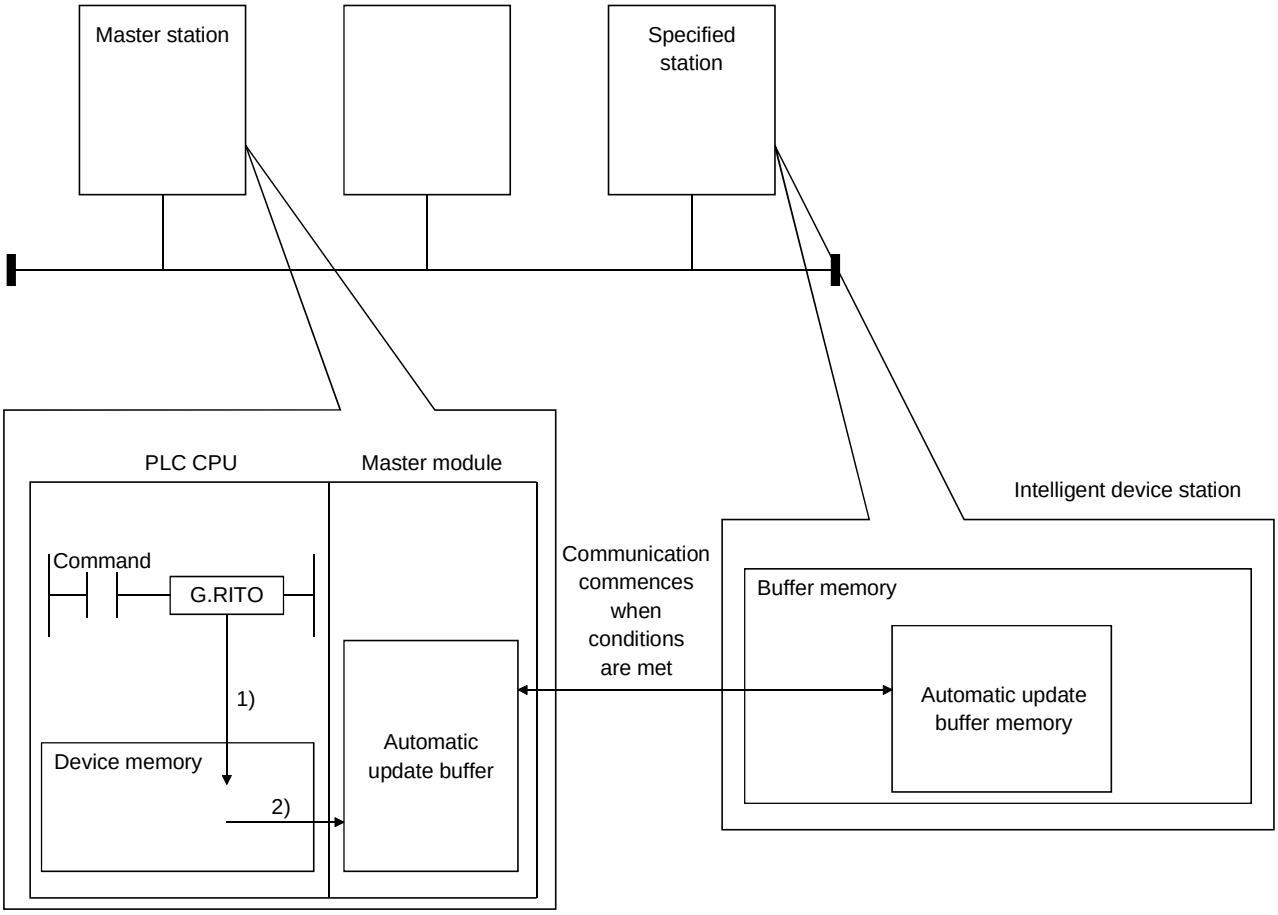
| Device | Description | Setting range | Data type |
|---|---|---|---|
| Un | Start I/O number of the module | 0 to FE$_H$ | Binary 16 bits |
| n1 | Intelligent device station number | 1 to 64 | |
| | Random access buffer specification | FF$_H$ | |
| n2 | The offset value of the automatic update buffer of the intelligent device station specified by the master station or the random access buffer. | Between 0 and parameter setting value ＊1 | |
| (D) | Start number of the device to which write data is to be stored. | Within the range of the specified device | Device |
| n3 | Number of points to write | 0 to 4096 ＊2 | Binary 16 bits |

＊1: The value set in the station information settings of the network parameters of the GX Developer.
＊2: No processing will be performed when set to "0".


App - 26

(1) Functions

(a) Operation chart for the RITO instruction




1) Accesses the device after the device specified by (D) of the master module specified by Un.
2) Writes to the automatic update buffer specified by n1 and n2.

(b) The RITO instruction writes data when it is executed.
However, this instruction cannot be executed simultaneously at more than one location for the same intelligent device station.

(c) The maximum points that can be read by the RITO instruction are 4096.

(d) The basic number of steps of the RITO instruction is 9 steps.

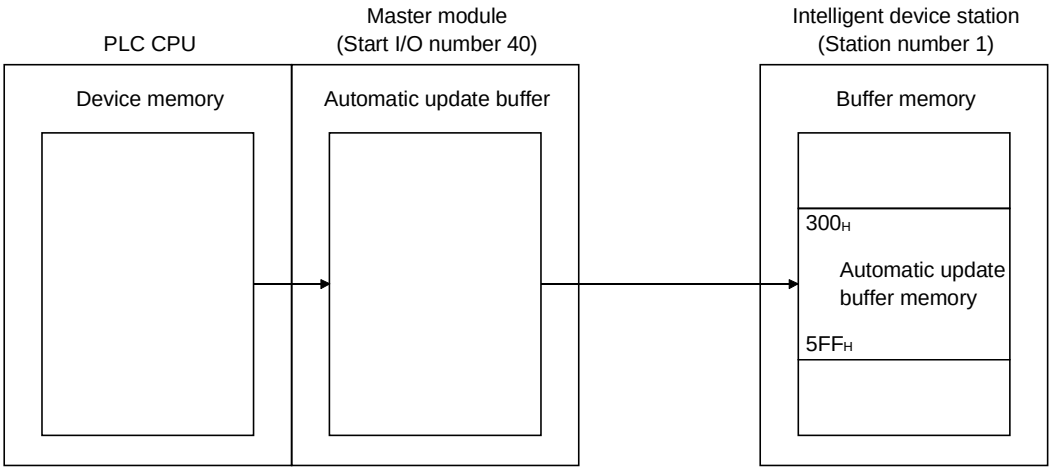
(e) The automatic update buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

## (2) Operation error

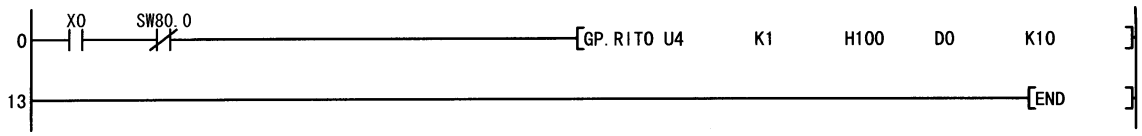
In the following cases, operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

| Error code | Description of operation error |
|---|---|
| 2112 | When the module specified by Un is not an intelligent function module. |
| | When the module specified by Un is not a special function module. |
| 4002 | When an attempt was made to execute an unsupported instruction. |
| 4003 | When the number of devices in the instruction is incorrect. |
| 4004 | When the instruction specifies a device that cannot be used. |
| 4100 | When the setting for number of points to write (n3) is outside of the setting range. |
| | When the station number specified with n1 does not exist. |

## (3) Program example




When X0 is turned ON, the following example program writes 10-word data from D0 to the automatic update buffer offset value starting from 100 ($400_H$ of the intelligent device station) in the master module.
(When the link special register (SW) refresh device is set to SW0)

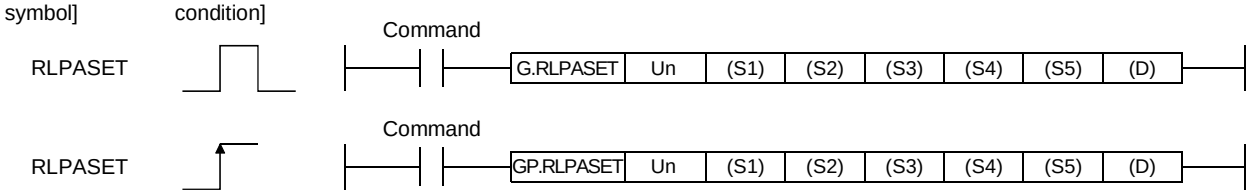


## Appendix 2.7 RLPASET instruction

Set the network parameter to the master station and start up the data link.

| Set data | Usable devices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Internal device (System, user) | | File register | MELSECNET/H Direct J□\□ | | Special function module U□\G□ | Index register Z□ | Constant | | Other |
| | Bit | Word | | Bit | Word | | | K, H | S | |
| (S1) | — | ○ | | — | | | | — | — | — |
| (S2) | — | ○ | | — | | | | — | — | — |
| (S3) | — | ○ | | — | | | | — | — | — |
| (S4) | — | ○ | | — | | | | — | — | — |
| (S5) | — | ○ | | — | | | | — | — | — |
| (D) | ○ | | | — | | | | — | — | — |

[Instruction symbol] [Execution condition]



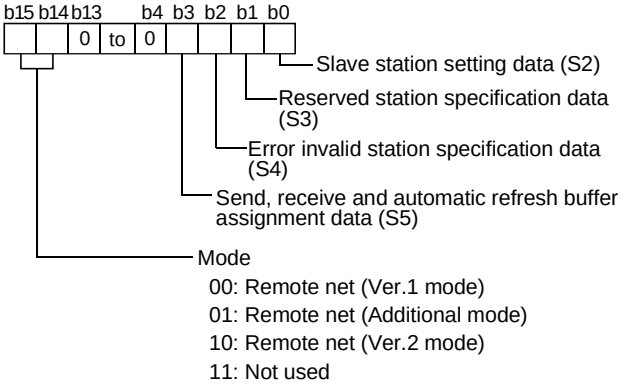

### Master station set data

| Device | Description | Setting range | Data type |
|---|---|---|---|
| Un | Start I/O number of the module | 0 to FE$_H$ | Binary 16 bits |
| (S1) ✻ | Start number of the device in which control data is stared. | Within the range of the specified device | Device name |
| (S2) ✻ | Start number of the device in which slave station setting data is stored. | Within the range of the specified device | |
| (S3) ✻ | Start number of the device in which reserved station specification data is stored. | Within the range of the specified device | |
| (S4) ✻ | Start number of the device in which error invalid station specification data is stored. | Within the range of the specified device | |
| (S5) ✻ | Start number of the device in which send, receive and automatic refresh buffer assignment data is stored. | Within the range of the specified device | |
| (D) | Device that is turned ON for one scan upon completion of reading.<br>(D)+1 also turns ON at an abnormal completion. | Within the range of the specified device | Bit |

• The file register of each of the local device and the program cannot be used as a device for setting data.

✻ When the setting data for (S2) to (S5) are not to be set, specify a dummy device.

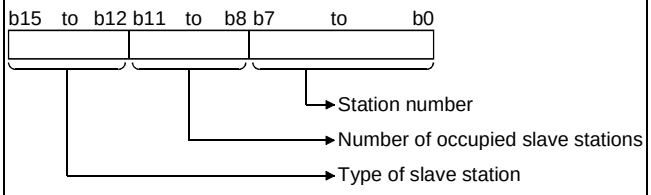
Control data

| Device | Item | Set data | Setting range ＊2 | Set by |
|---|---|---|---|---|
| (S1) + 0 | Completion status | Stores the status when the instruction is complete.<br>0 : No error (normal completion)<br>Other than 0: Error code | — | System |
| (S1) + 1 | Setting flag | Specifies whether the individual setting data from (S2) to (S5) is valid or invalid.<br>0: Invalid ＊1<br>1: Valid<br>  | — | User |
| (S1) + 2 | Number of connected modules involved in communication | Sets the number of connected slave stations. | 1 to 64 | |
| (S1) + 3 | Number of retries | Sets the number of retries to a communication faulty station. | 1 to 7 | |
| (S1) + 4 | Number of automatic return modules | Sets the number of slave stations that can be returned per one link scan. | 1 to 10 | |
| (S1) + 5 | Operation specification when CPU is down | Specifies the data link status when a master station PLC CPU error occurs.<br>0: Stop<br>1: Continue | 0, 1 | |
| (S1) + 6 | Scan mode specification | Specifies either the synchronous or asynchronous mode for sequence scan.<br>0: Asynchronous<br>1: Synchronous | 0, 1 | |
| (S1) + 7 | Delay time setting | Set 0 for the delay time. | 0 | |

＊1: For the setting data specified invalid, default parameter will be applied.

＊2: Setting a value outside the setting range results in abnormal completion.

## Slave station setting data

<table>
<tr><th>Device</th><th>Item</th><th>Set data</th><th>Setting range</th><th>Set by</th></tr>
<tr><td rowspan="4">(S2) + 0<br>to<br>(S2) + 63</td><td rowspan="4">Setting for 1 to 64 modules ＊3</td><td>The type of slave station, number of occupied slave stations and station number are set as follows.<br> 
<br>The default parameter settings are "0101H to 0140H" (station number: 1 to 64, number of occupied slave stations: 1, type of slave station: remote I/O station).</td><td>—</td><td rowspan="4">User</td></tr>
<tr><td>Setting of the station number<br>1 to 64 (BIN setting)</td><td>1 to 40H</td></tr>
<tr><td>Setting of the number of occupied slave stations<br><table><tr><th>Number of occupied slave stations</th><th>Setting</th></tr><tr><td>Station 1</td><td>1H</td></tr><tr><td>Station 2</td><td>2H</td></tr><tr><td>Station 3</td><td>3H</td></tr><tr><td>Station 4</td><td>4H</td></tr></table></td><td>1 to 4H</td></tr>
<tr><td>Setting of the type of slave station ＊4<br><table><tr><th>Type of slave station</th><th>Setting</th></tr><tr><td>Ver.1compatible remote I/O station</td><td>0H</td></tr><tr><td>Ver.1compatible remote device station</td><td>1H</td></tr><tr><td>Ver.1compatible intelligent device station</td><td>2H</td></tr><tr><td>Ver. 2 compatible single remote device station</td><td>5H</td></tr><tr><td>Ver. 2 compatible single intelligent device station</td><td>6H</td></tr><tr><td>Ver. 2 compatible double remote device station</td><td>8H</td></tr><tr><td>Ver. 2 compatible double intelligent device station</td><td>9H</td></tr><tr><td>Ver. 2 compatible quadruple remote device station</td><td>BH</td></tr><tr><td>Ver. 2 compatible quadruple intelligent device station</td><td>CH</td></tr><tr><td>Ver. 2 compatible octuple remote device station</td><td>EH</td></tr><tr><td>Ver. 2 compatible octuple intelligent device station</td><td>FH</td></tr></table></td><td>0 to FH</td></tr>
</table>

＊3: Perform the settings for as many connected modules involved in communication as has been specified by the control data.

＊4: Setting a value outside the setting range in the slave station type setting results in abnormal completion.

## Reserved station specification data

| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S3) + 0 to (S3) + 3 | Setting for 1 to 64 modules ＊5 | Specify reserved stations. ＊6<br>0: Not specified<br>1: Specified<br>b15 b14 b13 b12 to b3 b2 b1 b0<br>(S3)+0: 16 15 14 13 to 4 3 2 1<br>(S3)+1: 32 31 30 29 to 20 19 18 17<br>(S3)+2: 48 47 46 45 to 36 35 34 33<br>(S3)+3: 64 63 62 61 to 52 51 50 49<br>1 to 64 in the table indicate station numbers.<br>The default parameter setting is "No reserved station specification for all stations." | — | User |

＊5: Perform the settings for station numbers up to the largest station number set by the slave station setting data.

＊6: Specify only the head station number of a module in the case of a remote station, local station or intelligent device station that occupies 2 or more stations.

## Error invalid station specification data

| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S4) + 0 to (S4) + 3 | Setting for 1 to 64 modules ＊7 | Specify the error invalid station. ＊8<br>0: Not specified<br>1: Specified<br>b15 b14 b13 b12 to b3 b2 b1 b0<br>(S4)+0: 16 15 14 13 to 4 3 2 1<br>(S4)+1: 32 31 30 29 to 20 19 18 17<br>(S4)+2: 48 47 46 45 to 36 35 34 33<br>(S4)+3: 64 63 62 61 to 52 51 50 49<br>1 to 64 in the table indicate station numbers.<br>The default parameter setting is "No error invalid station specification for all stations." | — | User |

＊7: Perform the settings for station numbers up to the largest station number set by the slave station setting data.

＊8: Specify only the head station number of a module in the case of a remote station, local station or intelligent device station that occupies 2 or more stations.
The reserved station specification is given the higher priority if both error invalid station and reserved station specifications are made for the same station.


App - 32

## Send, receive and automatic refresh buffer assignment data

| Device | Item | Set data | Setting range | Set by |
|---|---|---|---|---|
| (S5) + 0<br>to<br>(S5) + 77 | Setting for 1 to 26 modules ＊9 | Specify assignments of buffer memory size at transient transmission to local stations and intelligent device stations.<br>(S5)+0 Send buffer size<br>(S5)+1 Receive buffer size<br>(S5)+2 Automatic refresh buffer size<br>} Settings for the first module<br>to<br>(S5)+75 Send buffer size<br>(S5)+76 Receive buffer size<br>(S5)+77 Automatic refresh buffer size<br>} Settings for the 26th module<br>The default parameter settings are "send buffer size: 40H, receive buffer size: 40H, automatic refresh buffer size: 80H." | Send/receive buffer ＊10:<br>0H (no setting), 40H to 1000H<br>0 (word) (no setting)<br>64 to 4096 (words)<br><br>Automatic refresh buffer ＊11:<br>0H (no setting), 80H to 1000H<br>0 (word) (no setting)<br>128 to 4096 (words) | User |

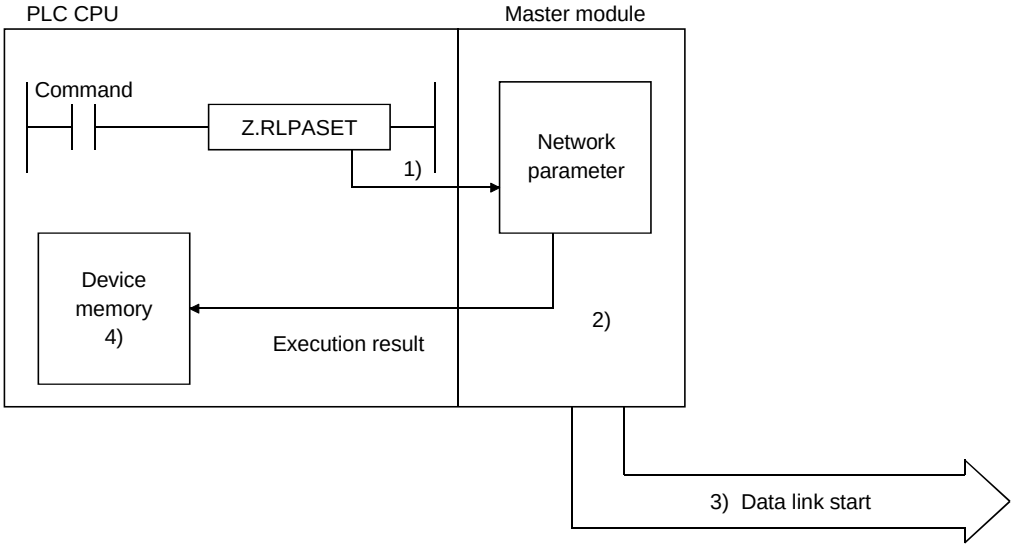
＊9: Perform the settings for stations specified as local stations or intelligent device stations in the slave station setting data, starting from the smallest station number.

＊10: Keep the total size of the send and receive buffer sizes at 1000H (4096 (words)) or less.
Specify the size of data to be sent and received plus 7 words for the send and receive buffer sizes, respectively.
Setting a value outside the setting range results in abnormal completion.

＊11: Keep the total size of the automatic refresh buffer sizes at 1000H (4096 (words)) or less.
Specify the necessary automatic refresh buffer size for each intelligent device station.
Setting a value outside the setting range results in abnormal completion.

(1) Functions

(a) Operation chart for the RLPASET instruction.




1) Pass the network parameters set in (S1) to (S5) to the master module specified by Un.
2) The master module analyzes the settings of the network parameters.
3) If the network parameter settings are correct, the data link is started.
4) The device specified by (D) turns on.

(b) It is only possible to execute one RLPASET instruction at a time.

(C) There are two types or interlock signals for the RLPASET instruction: the completion device (D) and status display device at completion (D) + 1.

1) Completion device

Turns ON in the END Processing of the scan where the RLPASET instruction is completed, and turns OFF in the next END processing.

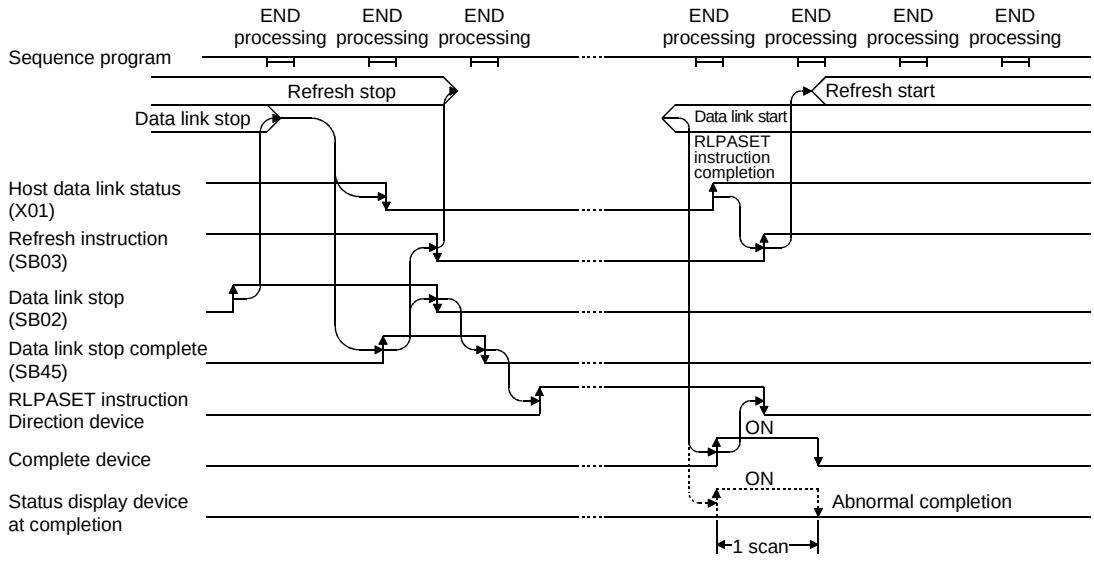
2) Status display device at completion

Turns On and OFF depending on the completion status of the RLPASET instruction.

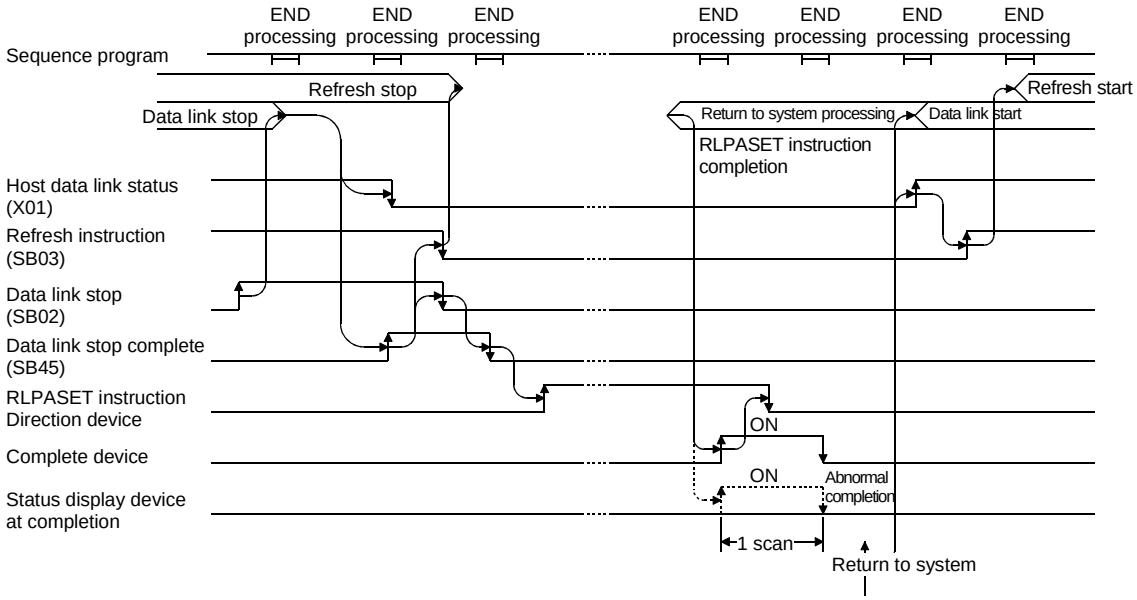
Normal completion : Stays OFF and does not change.

Abnormal completion : Turns ON in the END processing of the scan where the RLPASET instruction is completed, and turns OFF in the next END processing.

[When all the stations are normal]




[When all the stations are faulty]



### (4) Operation error

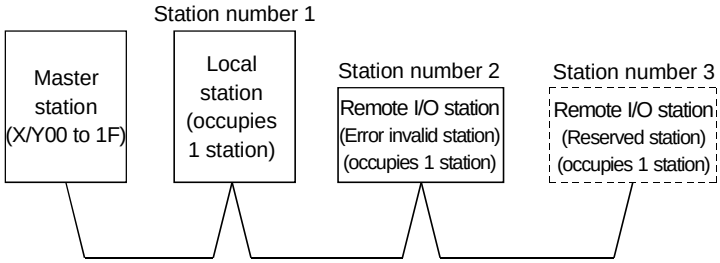
In the following cased, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

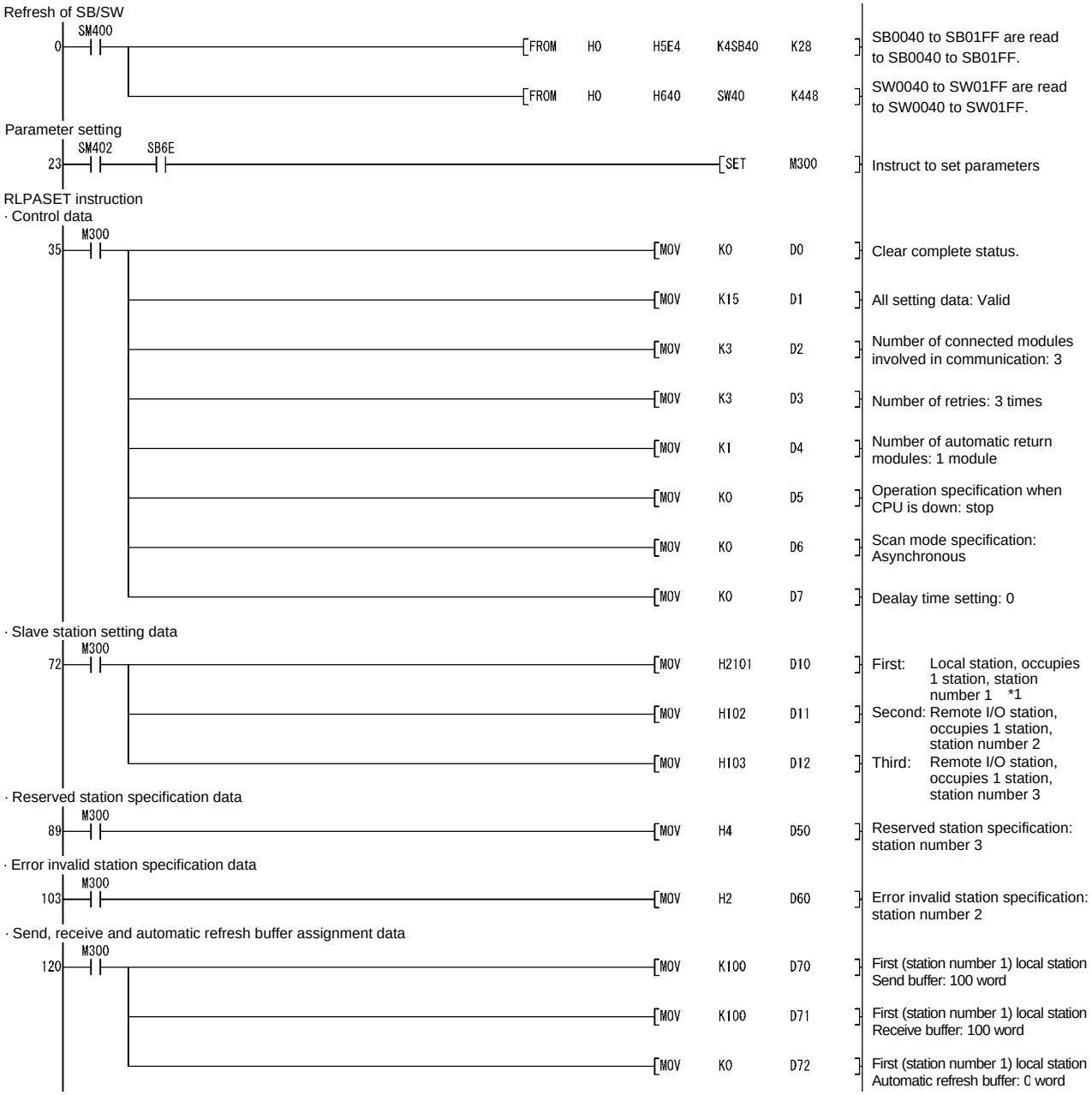
| Error code | Description of operation error |
|---|---|
| 2112 | When the module specified by Un is not an intelligent function module. |
| 4002 | When an attempt was made to execute an unsupported instruction. |
| 4003 | When the number of devices in the instruction is incorrect. |
| 4004 | When the instruction specifies a device that cannot be used. |
| 4100 | When the instruction contains the data cannot be used. |
| 4101 | When the number of points for data used in the instruction exceeds the available range, or storage data and constants of a device specified by the instruction exceeds the available range (including dummy devices).<br>The number of points required for each data is shown below.<br>• Control data : 8 points<br>• Slave station setting data : 64 points<br>• Reserved station specification data : 4 points<br>• Error invalid station specification data : 4 points<br>• Send, receive and automatic refresh buffer assignment data : 78 points<br>Example: Assume that data link registers D0 to D12287 are available for the Q02CPU. If the device head number of the slave station setting data is set to D12284 because there are only 4 slave stations, the PLC CPU nonetheless checks the range from D12284 to D122347 (for 64 stations) and an error indicating that the available range is exceeded occurs. |


App - 36

## (5) Program example

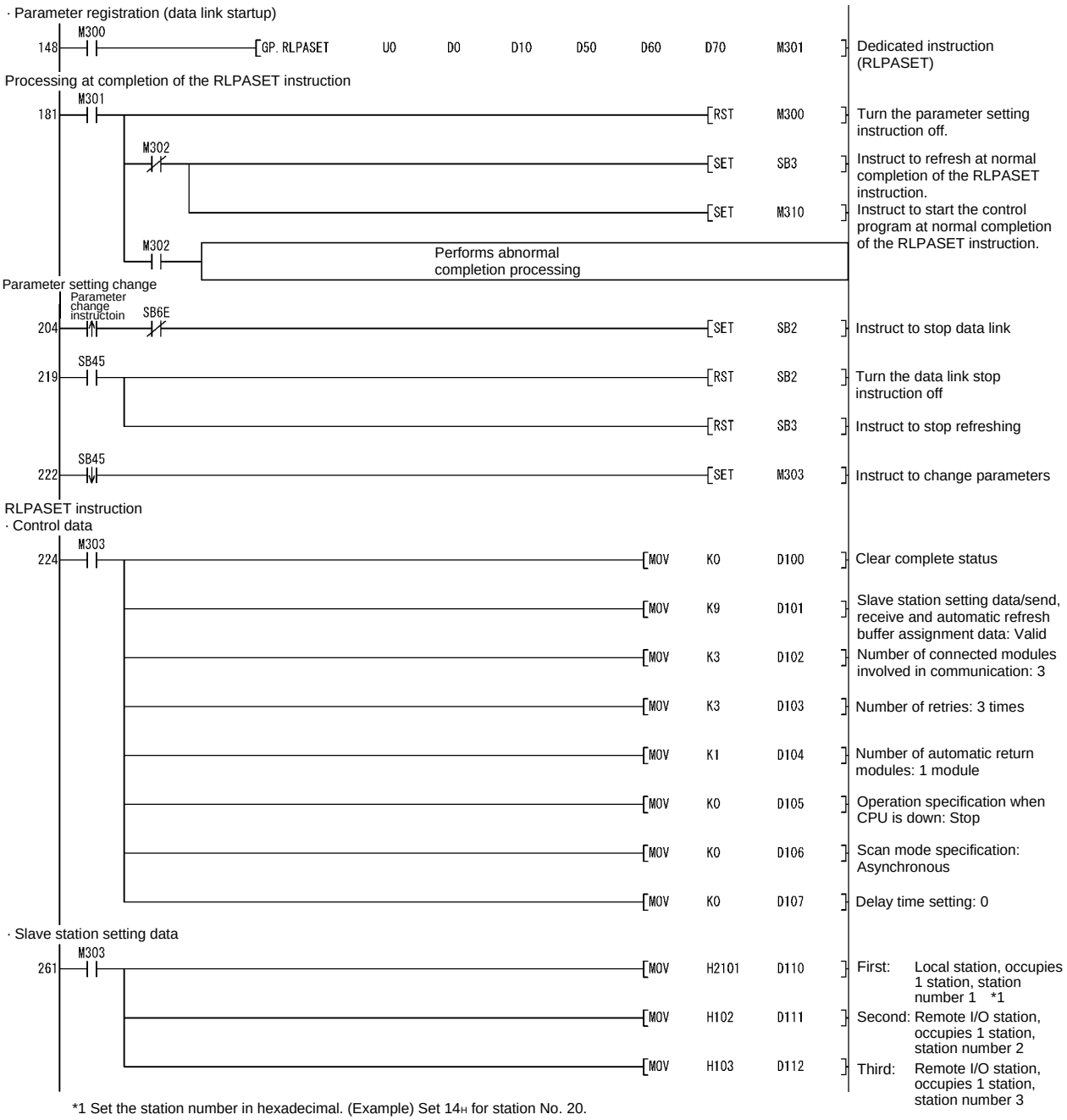
This program sets the network parameters for the master module mounted at the I/O numbers X/Y00 to X/Y1F and starts the data link.


Station number 1
Master station (X/Y00 to 1F)
Local station (occupies 1 station)
Station number 2
Remote I/O station (Error invalid station) (occupies 1 station)
Station number 3
Remote I/O station (Reserved station) (occupies 1 station)


Refresh of SB/SW
SM400
0
FROM H0 H5E4 K4SB40 K28
SB0040 to SB01FF are read to SB0040 to SB01FF.
FROM H0 H640 SW40 K448
SW0040 to SW01FF are read to SW0040 to SW01FF.
Parameter setting
SM402 SB6E
23
SET M300
Instruct to set parameters
RLPASET instruction
· Control data
M300
35
MOV K0 D0
Clear complete status.
MOV K15 D1
All setting data: Valid
MOV K3 D2
Number of connected modules involved in communication: 3
MOV K3 D3
Number of retries: 3 times
MOV K1 D4
Number of automatic return modules: 1 module
MOV K0 D5
Operation specification when CPU is down: stop
MOV K0 D6
Scan mode specification: Asynchronous
MOV K0 D7
Dealay time setting: 0
· Slave station setting data
M300
72
MOV H2101 D10
First: Local station, occupies 1 station, station number 1 *1
MOV H102 D11
Second: Remote I/O station, occupies 1 station, station number 2
MOV H103 D12
Third: Remote I/O station, occupies 1 station, station number 3
· Reserved station specification data
M300
89
MOV H4 D50
Reserved station specification: station number 3
· Error invalid station specification data
M300
103
MOV H2 D60
Error invalid station specification: station number 2
· Send, receive and automatic refresh buffer assignment data
M300
120
MOV K100 D70
First (station number 1) local station Send buffer: 100 word
MOV K100 D71
First (station number 1) local station Receive buffer: 100 word
MOV K0 D72
First (station number 1) local station Automatic refresh buffer: 0 word

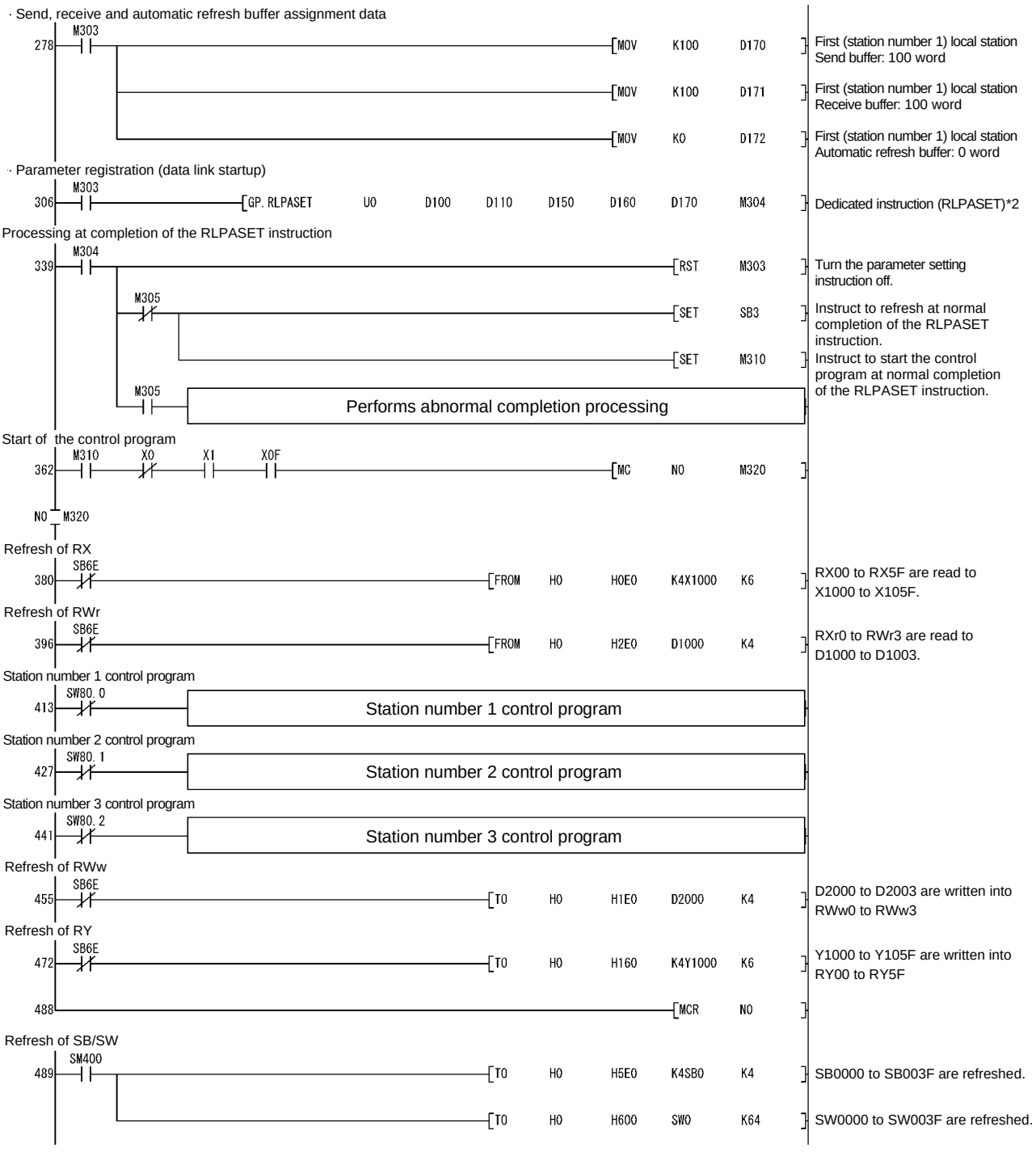
*1 Set the station number in hexadecimal. (Example) Set $14_H$ for station No. 20.


App - 37




*1 Set the station number in hexadecimal. (Example) Set $14_H$ for station No. 20.


App - 38




*2 D150 and D160 are dummy devices.


App - 39

## Appendix 3 Differences Between the New and Previous Models

The following lists the differences between the QJ61BT11N and older models:

| | QJ61BT11N | QJ61BT11 | A (1S) J61BT11 | A (1S) J61QBT11 |
|---|---|---|---|---|
| Startup procedure | Startup using the parameters of the master station CPU (Yn6 and Yn8 cannot be used) | Startup using the parameters of the master station CPU (Yn6 and Yn8 cannot be used) | Startup using Yn6, Yn8 and dedicated instructions | Startup using Yn6, Yn8, and master station CPU parameters |
| Remote device station initialization procedure registration function | Yes | Yes | No | No |
| Module reset function using the sequence program | No | No | Yes | Yes |
| Access to other stations via the CC-Link | Yes | Yes | No | No |
| Parameter settings using FROM/TO instruction | Not supported | Not supported | Supported | Supported |
| Parameter settings using dedicated instruction | Supported | Supported | Supported | Not supported |
| Parameter settings using GX Developer | Supported | Supported | Not supported | Supported |
| Standby master function | The master station that is down can recover | The master station that is down can recover | The master station that is down cannot recover | The master station that is down cannot recover |
| Event issuance for the interrupt program | Supported | Supported | Not supported | Not supported |
| Parameter verification test | No | No | Yes | Yes |
| $E^2$PROM | No (CPU parameters) | No (CPU parameters) | Yes | Yes |
| Expanded cyclic setting | Yes | No | No | No |
| Slave station refresh/compulsory clear setting in case of PLC CPU STOP | Yes | No | No | No |


App - 40

## Appendix 4 Precautions when Changing from AJ61QBT11 to QJ61BT11N

(1) The following dedicated instructions for AJ61QBT11 cannot be used in QJ61BT11N.

| Instruction | Description |
|---|---|
| CCL, CCLEND | Performs mail box registration for intelligent device and remote device instructions. |
| SPCCLR | Performs interrupt command to intelligent device instruction. |
| SPCBUSY | Reads remote station status. |
| SEND | Sends data (message) to designated transmission destination station (QnACPU). |
| RECV | Reads data (message) that has been sent by SEND instruction. |
| READ, SREAD | Designated station QnACPU word device data read by local station. |
| WRITE, SWRITE | Data from local station written to designated station QnACPU word device data. |
| REQ | Sends and executes transient (such as remote RUN/STOP) requests to other stations. |

(2) The conditions setting switches for AJ61QBT11 shown below cannot be used on QJ61BT11N.
Use the GX Developer and set the CC-Link network parameters.

| Number | Setting Description |
|---|---|
| SW1 | Station type |
| SW4 | Input status of data link error station |
| SW5 | Number of occupied stations |

## Appendix 5 Precautions when Changing from QJ61BT11 to QJ61BT11N

(1) When the remote net mode of the QJ61BT11 is used, use the remote net ver. 1 mode of the QJ61BT11N for changing.

(2) When the remote I/O net mode of the QJ61BT11 is used, use the remote I/O net mode of the QJ61BT11N for changing.

(3) When the remote net ver. 2 mode/remote net additional mode is set to the master station of the QJ61BT11, an error (error code: B399, B983, B984) occurs.

| Error code (hexadecimal) | Error details | Cause of error occurrence (details) | Corrective action | Detectability | |
|---|---|---|---|---|---|
| | | | | Master station | Local station |
| B399 | Number of connected modules setting error (parameter) | The number of connected modules parameter was set to a value other than "1 to 64". | Set a value within the range from "1 to 64". | ○ | × |
| | | The remote net ver. 2 mode/remote net additional mode has been set to the master station of the QJ61BT11. | Set to the remote net ver. 1 mode/remote I/O net mode. | | |
| B983 | Model illegal | The remote net ver. 2 mode/remote net additional mode has been set to the master station of the QJ61BT11. | Set to the remote net ver. 1 mode/remote I/O net mode. | ○ | ○ |
| B984 | Model illegal | The remote net ver. 2 mode/remote net additional mode has been set to the master station of the QJ61BT11. | Set to the remote net ver. 1 mode/remote I/O net mode. | ○ | × |

(4) When the remote net ver. 2 mode/remote net additional mode is set to the local station of the QJ61BT11, the local station operates in the remote net ver. 1 mode.

## Appendix 6 CPU-dependent Function Availability

The following table indicates whether the functions are available or not depending on the CPU.

| Functions | | | Q02/Q02H/Q06H/ Q12H/Q25H/Q12PH Q25PHCPU | Q00J/Q00/Q01CPU | Remote I/O staion |
|---|---|---|---|---|---|
| Basic functions | Communication with remote I/O station | | ○ | ○ | ○ |
| | Communication with remote device station | | ○ | ○ | ○ |
| | Communication with local station | | ○ | ○ | ○ |
| | Communication with intelligent device station | | ○ | ○ | ○ |
| | Parameter setting with GX Developer | Network parameter | ○ | ○ | ○ |
| | | Automatic refresh parameter | ○ | ○ | ○ |
| | Parameter setting with dedicated instruction | | ○ | ○ | × |
| Functions for improving system reliability | Slave station cut-off function | | ○ | ○ | ○ |
| | Automatic return function | | ○ | ○ | ○ |
| | Data link status setting when the master station PLC CPU has an error | | ○ | ○ | ○ |
| | Setting the status of input data from a data link faulty station | | ○ | ○ | ○ |
| | Slave station refresh/compulsory clear setting in case of PLC CPU STOP | | ○ | ○ | ○ |
| | Standby master function | | ○ | ○ | × |
| Handy functions | Remote device station initialization procedure registration function | | ○ | ○ | ○ |
| | Event issuance for the interrupt program | | ○ | ○ *1 | × |
| | Automatic CC-Link startup | | ○ | ○ | ○ |
| | Remote net mode | | ○ | ○ | ○ |
| | Remote I/O net mode | | ○ | ○ | × |
| | Reserved station function | | ○ | ○ | ○ |
| | Error invalid station setting function | | ○ | ○ | ○ |
| | Scan synchronous function | Synchronous mode | ○ | ○ | × |
| | | Asynchronous mode | ○ | ○ | ○ |
| | Temporary error invalid station setting function | | ○ | ○ | ○ |
| | Data link stop/restart | | ○ | ○ | ○ |
| | Station number overlap checking function | | ○ | ○ | ○ |
| | Multiple PLC system support | | ○ | × | × |
| Functions for transient transmission | Transient transmission | | ○ | ○ | ○ |

○: Available ×: Unavailable

*1: Supported by Q00J/Q00/Q01CPU, starting with function Ver. B.


App - 42

## Appendix 7 Parameter Setting Checklist

This checklist may be used to set the parameters required to configure a CC-Link system.
Please make a copy of this checklist and use it as needed.
For more details, see Sections 6.3 to 6.6.

## Appendix 7.1 Parameter setting checklist

### Parameter setting checklist

| Item | | Setting range | Setting value |
|---|---|---|---|
| Start I/O No. | | 0000 to 0FE0 | 0000 |
| Operational settings | Data link disorder station setting | Input data hold/clear<br>Default: Clear | Hold/clear |
| | Case of CPU STOP setting | Refresh/clears compulsorily<br>Default: Refresh | Refresh/Clears compulsorily |
| | Number of occupied stations | Occupies 1 to 4 stations<br>Default: Occupies 1 station | |
| | Expanded cyclic setting | single/double/quadruple/octuple<br>Default: single | |
| Type | | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station<br>Default: Master station | Master station<br>Master station (Duplex function)<br>Local station<br>Standby master station |
| Mode | | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line<br>Default: Remote net (Ver.1 mode) | Remote net (Ver.1 mode)<br>Remote net (Ver.2 mode)<br>Remote net (Additional mode)<br>Remote I/O net mode<br>Off line |
| All connect count | | 1 to 64<br>Default: 64 | modules |
| Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote input (RX) | | Device name: Select from X, M, L, B, D, W, R or ZR | |
| Ver.2 Remote output (RY) | | Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR | |
| Ver.2 Remote register (RWr) | | Device name: Select from M, L, B, D, W, R or ZR | |
| Ver.2 Remote register (RWw) | | Device name: Select from M, L, B, T, C, ST, D, W, R or ZR | |
| Special relay (SB) | | Device name: Select from M, L, B, D, W, R, SB or ZR | |
| Special register (SW) | | Device name: Select from M, L, B, D, W, R, SW or ZR | |
| Retry count | | 1 to 7<br>Default: 3 | times |
| Automatic reconnection station count | | 1 to 10<br>Default: 1 | modules |
| Standby master station No. | | Blank, 1 to 64 (Blank: No standby master station specified)<br>Default: Blank | |
| PLC down select | | Stop/continue<br>Default: Stop | Stop/continue |
| Scan mode setting | | Asynchronous/synchronous<br>Default: Asynchronous | Asynchronous/synchronous |
| Delay information setting | | Set 0. | |

## Appendix 7.2 Station information setting checklist

### Station information setting checklist

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (Word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |


App - 44

| Station No. | Station type | Expanded cyclic setting | Number of occupied stations | Remote station points | Reserve/invalid station select | Intelligent buffer select (Word) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Send | Receive | Automatic |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |


App - 45

# MEMO


App - 46

# INDEX

Ind


[A]

Appendix ..... App-1
Applicable CPU ..... 2-4
Applicable system ..... 2-4
Automatic CC-Link startup ..... 1-9, 4-52
Automatic return function ..... 1-6, 4-26
Automatic update buffer ..... 8-21

[B]

Buffer memory list ..... 8-5

[C]

CC-Link dedicated cable ..... 3-3
CC-Link diagnostics ..... 13-16
CC-Link ver. installation/parameter matching status ..... 8-38
CC-Link version ..... 2-9
Communication between the master station and intelligent device stations ..... 12-1
Communication between the master station and local stations ..... 11-1
Communication between the master station and remote device stations ..... 10-1
Communication between the master station and remote I/O stations ..... 9-1
Communication buffer ..... 8-20
Communication with the remote I/O stations . 4-3
Communication with the local stations ..... 4-10
Communication with the remote device stations ..... 4-5
Compatible CC-Link ver. information ..... 8-38
Compatibility with CC-Link ..... 1-2
Completion status of remote device station initialization procedure ..... 8-28
Connecting the modules ..... 7-9
Connection cable ..... 3-1
CPU monitoring time setting ..... 8-31
Current link scan time ..... 8-34
Cyclic points increase ..... 1-12, 4-67
Cyclic transmission ..... A-14

[D]

Data link processing time ..... 5-1
Data link restart ..... 8-26
Data link restart acceptance ..... 8-27
Data link restart complete ..... 8-27
Data link restart result ..... 8-31
Data link stop ..... 8-26
Data link stop acceptance ..... 8-27
Data link stop complete ..... 8-27
Data link stop result ..... 8-32
Data link stop/restart ..... 1-10, 4-62
Data link status setting when the master station PLC CPU has an error ..... 1-7, 4-27
Dedicated instruction ..... 4-75
Dedicated instruction list ..... App-2
Delay timer information ..... 8-33
Detailed LED display status ..... 8-32
Details of the I/O signals ..... 8-4
Differences between the new and previous models ..... App-40

[E]

EMC directive ..... A-13
Error invalid station setting function .... 1-10, 4-56
Error invalid station specified status .... 8-29, 8-34
Event issuance for the interrupt program ..... 1-9, 4-49
Example of parameter settings with GX Developer (Remote I/O net mode) ..... 6-43
Example of parameter settings with GX Developer (Remote net additional mode) ..... 6-29
Example of parameter settings with GX Developer (Remote net ver.1 mode) ..... 6-5
Example of parameter settings with GX Developer (Remote net ver.2 mode) ..... 6-17
Example of parameter setting with dedicated instruction ..... 6-48
Execution status of remote device station initialization procedure ..... 8-28
External dimensions diagram ..... App-1




Index - 1

[F]
Faulty stations are generated depending on transmission rate ... 13-7
Faulty stations cannot be detected ... 13-7
Forced master switching ... 8-27
Forced master switching instruction result ... 8-33
Forced master switching request acknowledgement ... 8-28
Forced master switching request complete ... 8-28

[H]
H/M information ... 13-20
Handling precautions ... 7-3
Hardware test ... 7-7
Host line status ... 8-30
Host mater/standby master operation status ... 8-30
Host mode ... 8-28
Host monitoring ... 13-16
Host station number ... 8-33
Host parameter status ... 8-33
Host standby master station setting status ... 8-28
Host station operation status ... 8-29
Host station switch change detection ... 8-29
Host type ... 8-28
How to check the function version ... 2-8

[ I ]
I/O signal list ... 8-2
Initial setting of the remote device station ... 10-7, 10-25, 10-45
Input data status of host data link faulty station ... 8-28
Installation ... 7-3
Installation environment ... 7-4
Intelligent device module ... A-14
Intelligent device station ... A-14, 1-1
Intelligent device station communication ... 1-5
Intelligent function module ... A-15
Internal current consumption ... 3-1

[L]
LED display ... 7-5
Line status ... 8-36
Line test ... 7-15
Line test result ... 8-37
Line test 1 result ... 8-37
Line test acceptance status ... 8-27
Line test complete status ... 8-28
Line test request ... 8-26
Line test result ... 8-32
Line test station setting ... 8-31
Link refresh time ... 5-40
Link scan time ... 5-1
Link special relays (SB) ... 8-19, 8-26
Link special registers (SW) ... 8-20, 8-31
Local module ... A-14
Local station ... A-14, 1-1
Local station automatic refresh parameter settings ... 6-15, 6-27, 6-40
Local station communication ... 1-4
Local station network parameter settings ... 6-12, 6-24, 6-37
Loading status ... 8-33
Loading/parameter consistency status ... 8-37
Loop test ... 13-19

[M]
Master module ... A-14
Master station ... A-14, 1-1
Master station automatic refresh parameter settings ... 6-10, 6-22, 6-34
Master station information ... 8-29
Master station network parameter settings ... 6-5, 6-17, 6-29
Master station return specification information ... 8-29
Master switching request acknowledgment ... 8-28
Master switching request complete ... 8-28
Master station transient transmission status ... 8-30
Master module ... A-14
Max. communication station number ... 8-34
Max. link scan time ... 8-34
Maximum number of link points ... 3-1
Maximum overall cable distance ... 3-1, 3-3, 3-5
Maximum transmission distance ... 3-1
Min. link scan time ... 8-34
Mode selection method ... 8-40
Mode setting status ... 8-33
Module operating status ... 8-33
Module status ... 8-27, 8-31
Monitoring time setting ... 8-31
Multiple temporary error invalid station specification ... 8-31


Index - 2

[N]
No. of automatic return stations ..... 8-33
No. of retries information ..... 8-33
Notes on the system configuration ..... 2-6
Number of host occupied stations ..... 8-29
Number of connected modules ..... 8-34
Number of CPUs that can be installed ..... 2-4
Number of I/O occupied points ..... 3-1
Number of link points per station ..... 3-1
Number of occupied station ..... 3-1

[O]
Offline test status ..... 8-28
Operation specification when CPU is down status ..... 8-29
Other station data link status ..... 8-30, 8-35
Other station fuse blown status ..... 8-30, 8-36
Other station monitoring ..... 13-17
Other station switch change status ..... 8-30, 8-36
Other station watchdog timer error occurrence status ..... 8-35
Other station watchdog timer error status ..... 8-30

[P]
Parameter information ..... 8-33
Parameter information read acknowledgment status ..... 8-28
Parameter information read completion status ..... 8-28
Parameter information read request ..... 8-26
Parameter memory ..... 6-1
Parameter receive status ..... 8-29
Parameter setting checklist ..... App-43
Parameter setting items ..... 6-3
Parameter setting status ..... 8-29
Parameter setting test result ..... 8-32
Parameter setting with dedicated instruction ..... 1-6, 4-23
Parameter settings ..... 6-1
Part identification nomenclature and settings ..... 7-4
Performance specification ..... 3-1
Precautions on programming ..... 8-1
Procedure before starting the data link ..... 7-1
Processing time for dedicated instructions ..... 5-35
Programming ..... 8-1

[R]
Random access buffer ..... 8-20
Refresh instruction acknowledgment status at standby master switching ..... 8-27
Refresh instruction at standby master switching ..... 8-26
Refresh instruction at standby master switching result ..... 8-31
Refresh instruction complete status at standby master switching ..... 8-27
Refresh instruction when changing parameters by the dedicated instruction ..... 8-26
Remote device station ..... A-14, 1-1
Remote device station communication ..... 1-3
Remote device station initialization procedure registration function ..... 1-9, 4-45
Remote device station initialization procedure registration instruction ..... 8-27
Remote device station initialization procedure registration instruction result ..... 8-33
Remote I/O net mode ..... A-14
Remote I/O station ..... A-14, 1-1
Remote I/O station communication ..... 1-2
Remote I/O station points setting ..... 1-12, 4-65
Remote input (RX) ..... 8-10
Remote module ..... A-14
Remote net mode ..... A-14, 4-54
Remote net additional mode ..... A-14, 2-1, 4-69
Remote net ver. 1 mode ..... A-14, 2-2
Remote net ver. 2 mode ..... A-14, 2-2, 4-68
Remote output (RY) ..... 8-10
Remote register (RWr) ..... 8-14
Remote register (RWw) ..... 8-14
Remote station ..... A-14
Reserved station function ..... 4-55
Reserved station specified status ..... 8-29, 8-34
RIRCV ..... App-13
RIRD ..... App-3
RIFR ..... App-23
RISEND ..... App-18
RITO ..... App-26
RIWT ..... App-8
RLPASET ..... App-29
RWr ..... A-15
RWw ..... A-15
RX ..... A-15
RY ..... A-15


Index - 3

[S]
SB ..... A-15
Scan mode setting information ..... 8-29
Scan synchronous function ..... 1-10, 4-57
Selecting a mode according to the system .... 1-9
Setting checklist ..... App-42
Setting the status of input data from a data link faulty station ..... 1-7, 4-28
Slave station cut-off function ..... 1-6, 4-25
Slave station offset, size information ..... 8-17
Slave station refresh/compulsory clear setting in case of PLC CPU STOP ..... 1-12, 4-29
Special function module ..... A-15
Standby master function ..... 1-7, 4-31
Standby master station ..... A-14
Standby master station information ..... 8-29
Standby master station number ..... 8-34
Station information setting checklist ..... App-44
Station number overlap checking function ..... 1-10,4-63
Station number overlap status ..... 8-37
Station number setting ..... 7-13
Station number setting switches ..... 7-5
Station status at error occurrence ..... 5-44
SW ..... A-15
Switch setting ..... 7-13
Switch setting status ..... 8-29, 8-34
System configuration ..... 2-1
System down prevention ..... 1-6

[T]
T-Branch connection ..... 7-11
Temporary error invalid acceptance status .. 8-27
Temporary error invalid canceling acknowledgment status ..... 8-27
Temporary error invalid canceling complete status ..... 8-27
Temporary error invalid canceling request ... 8-26
Temporary error invalid complete status ..... 8-27
Temporary error invalid request ..... 8-26
Temporary error invalid station setting function ..... 1-10, 4-61
Temporary error invalid station setting information ..... 8-29
Temporary error invalid station specification ..... 8-31
Temporary error invalid station specification cancel result ..... 8-32
Temporary error invalid station specification result ..... 8-32
Temporary error invalid status ..... 8-35
Terminal block ..... 7-6
Terminal resistor ..... A-16
The remote device station is not operating normally ..... 13-7
The remote station/local station/intelligent device station/standby master station does not start up ..... 13-7
Tightening torque range ..... 7-3
Total number of stations ..... 8-34
Transient transmission ..... A-15, 1-11, 4-75
Transient transmission status ..... 8-30, 8-36
Transmission delay time ..... 5-4
Transmission rate ..... 3-1
Transmission rate/mode setting switch ..... 7-6
Transmission rate and mode settings ..... 7-14
Transmission rate setting ..... 8-32

[V]
Ver. 1 compatible slave station ..... A-14
Ver. 2 compatible slave station ..... A-14
Ver.2 compatible remote input ..... 8-22
Ver.2 compatible remote output ..... 8-22
Ver.2 compatible remote register (RWr) ..... 8-24
Ver.2 compatible remote register (RWw) ..... 8-24

[W]
Weight ..... 3-1
When a dedicated instruction is executed, the abnormal completion bit turns on. ..... 13-7
Wiring check ..... 7-10


Index - 4

# WARRANTY

Please confirm the following product warranty details before using this product.

## 1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

### [Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

### [Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

## 2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

## 3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

## 4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

## 5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

## 6. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
(2) The Mitsubishi programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable logic controller applications.
In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable logic controller range of applications.
However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

## HEADQUARTERS

MITSUBISHI ELECTRIC EUROPE B.V. **EUROPE**
German Branch
Gothaer Straße 8
**D-40880 Ratingen**
Phone: +49 (0) 21 02 / 486-0
Fax: +49 (0) 21 02 / 4 86-11 20
e mail: megfamail@meg.mee.com

MITSUBISHI ELECTRIC EUROPE B.V. **FRANCE**
French Branch
25, Boulevard des Bouvets
**F-92741 Nanterre Cedex**
Phone: +33 1 55 68 55 68
Fax: +33 1 55 68 56 85
e mail: factory.automation@fra.mee.com

MITSUBISHI ELECTRIC EUROPE B.V. **UK**
UK Branch
Travellers Lane
**GB-Hatfield Herts. AL10 8 XB**
Phone: +44 (0) 1707 / 27 61 00
Fax: +44 (0) 1707 / 27 86 95

MITSUBISHI ELECTRIC EUROPE B.V. **ITALY**
Italian Branch
Via Paracelso 12
**I-20041 Agrate Brianza (MI)**
Phone: +39 039 6053 1
Fax: +39 039 6053 312
e mail: factory.automation@it.mee.com

MITSUBISHI ELECTRIC EUROPE B.V. **SPAIN**
Spanish Branch
Carretera de Rubí 76-80
**E-08190 Sant Cugat del Vallés**
Phone: +34 9 3 / 565 3131
Fax: +34 9 3 / 589 2948
e mail: industrial@sp.mee.com

MITSUBISHI ELECTRIC CORPORATION **JAPAN**
Office Tower "Z" 14 F
8-12,1 chome, Harumi Chuo-Ku
**Tokyo 104-6212**
Phone: +81 3 6221 6060
Fax: +81 3 6221 6075

MITSUBISHI ELECTRIC AUTOMATION **USA**
500 Corporate Woods Parkway
**Vernon Hills, IL 60061**
Phone: +1 847 / 478 21 00
Fax: +1 847 / 478 22 83

## EUROPEAN REPRESENTATIVES

GEVA **AUSTRIA**
Wiener Straße 89
**A-2500 Baden**
Phone: +43 (0) 2252 / 85 55 20
Fax: +43 (0) 2252 / 488 60
e mail: office@geva.at

TEHNIKON **BELARUS**
Oktjabrskaya 16/5, Ap 704
**BY-220030 Minsk**
Phone: +375 (0) 17 / 22 75 704
Fax: +375 (0) 17 / 22 76 669
e mail: tehnikon@belsonet.net

Getronics b.v. **BELGIUM**
Control Systems
Pontbeeklaan 43
**B-1731 Asse-Zellik**
Phone: +32 (0) 2 / 467 17 51
Fax: +32 (0) 2 / 467 17 45
e mail: infoautomation@getronics.com

TELECON CO. **BULGARIA**
4, A. Ljapchev Blvd.
**BG-1756 Sofia**
Phone: +359 (0) 2 / 97 44 05 8
Fax: +359 (0) 2 / 97 44 06 1
e mail: —

INEA CR d.o.o. **CROATIA**
Drvinje 63
**HR-10000 Zagreb**
Phone: +385 (0) 1 / 36 67 140
Fax: +385 (0) 1 / 36 67 140
e mail: —

AutoCont **CZECHIA**
Control Systems s.r.o.
Nemocnicni 12
**CZ-702 00 Ostrava 2**
Phone: +420 59 / 6152 111
Fax: +420 59 / 6152 562
e mail: consys@autocont.cz

louis poulsen **DENMARK**
industri & automation
Geminivej 32
**DK-2670 Greve**
Phone: +45 (0) 43 / 95 95 95
Fax: +45 (0) 43 / 95 95 91
e mail: lpia@lpmail.com

UTU Elektrotehnika AS **ESTONIA**
Pärnu mnt.160i
**EE-11317 Tallinn**
Phone: +372 (0) 6 / 51 72 80
Fax: +372 (0) 6 / 51 72 88
e mail: utu@utu.ee

Beijer Electronics OY **FINLAND**
Ansatie 6a
**FIN-01740 Vantaa**
Phone: +358 (0) 9 / 886 77 500
Fax: +358 (0) 9 / 886 77 555
e mail: info@beijer.fi

PROVENDOR OY **FINLAND**
Teljänkatu 8 A 3
**FIN-28130 Pori**
Phone: +358 (0) 2 / 522 3300
Fax: +358 (0) 2 / 522 3322
e mail: —

UTECO A.B.E.E. **GREECE**
5, Mavrogenous Str.
**GR-18542 Piraeus**
Phone: +302 (0) 10 / 42 10 050
Fax: +302 (0) 10 / 42 12 033
e mail: uteco@uteco.gr

Meltrade Automatika Kft. **HUNGARY**
55, Harmat St.
**HU-1105 Budapest**
Phone: +36 (0)1 / 2605 602
Fax: +36 (0)1 / 2605 602
e mail: office@meltrade.hu

## EUROPEAN REPRESENTATIVES

MITSUBISHI ELECTRIC EUROPE B.V. – Irish Branch **IRELAND**
Westgate Business Park
**IRL-Dublin 24**
Phone: +353 (0) 1 / 419 88 00
Fax: +353 (0) 1 / 419 88 90
e mail: sales.info@meir.mee.com

SIA POWEL **LATVIA**
Lienes iela 28
**LV-1009 Riga**
Phone: +371 784 / 22 80
Fax: +371 784 / 22 81
e mail: utu@utu.lv

UAB UTU POWEL **LITHUANIA**
Savanoriu pr. 187
**LT-2053 Vilnius**
Phone: +370 (0) 52323-101
Fax: +370 (0) 52322-980
e mail: powel@utu.lt

INTEHSIS SRL **MOLDOVA**
Cuza-Voda 36/1-81
**MD-2061 Chisinau**
Phone: +373 (0)2 / 562 263
Fax: +373 (0)2 / 562 263
e mail: intehsis@mdl.net

Getronics b.v. **NETHERLANDS**
Control Systems
Donauweg 2 B
**NL-1043 AJ Amsterdam**
Phone: +31 (0) 20 / 587 67 00
Fax: +31 (0) 20 / 587 68 39
e mail: info.gia@getronics.com

Beijer Electronics AS **NORWAY**
Teglverksveien 1
**N-3002 Drammen**
Phone: +47 (0) 32 / 24 30 00
Fax: +47 (0) 32 / 84 85 77
e mail: info@beijer.no

MPL Technology Sp. z o.o. **POLAND**
ul. Sliczna 36
**PL-31-444 Kraków**
Phone: +48 (0) 12 / 632 28 85
Fax: +48 (0) 12 / 632 47 82
e mail: krakow@mpl.pl

Sirius Trading & Services srl **ROMANIA**
Bd. Lacul Tei nr. 1 B
**RO-72301 Bucuresti 2**
Phone: +40 (0) 21 / 201 7147
Fax: +40 (0) 21 / 201 7148
e mail: sirius_t_s@fx.ro

ACP Autocomp a.s. **SLOVAKIA**
Chalupkova 7
**SK-81109 Bratislava**
Phone: +421 (02) / 5292-22 54, 55
Fax: +421 (02) / 5292-22 48
e mail: info@acp-autocomp.sk

INEA d.o.o. **SLOVENIA**
Stegne 11
**SI-1000 Ljubljana**
Phone: +386 (0) 1-513 8100
Fax: +386 (0) 1-513 8170
e mail: inea@inea.si

Beijer Electronics AB **SWEDEN**
Box 426
**S-20124 Malmö**
Phone: +46 (0) 40 / 35 86 00
Fax: +46 (0) 40 / 35 86 02
e mail: info@beijer.se

ECONOTEC AG **SWITZERLAND**
Postfach 282
**CH-8309 Nürensdorf**
Phone: +41 (0) 1 / 838 48 11
Fax: +41 (0) 1 / 838 48 12
e mail: info@econotec.ch

## EUROPEAN REPRESENTATIVES

GTS **TURKEY**
Darülaceze Cad. No. 43 KAT: 2
**TR-80270 Okmeydani-Istanbul**
Phone: +90 (0) 212 / 320 1640
Fax: +90 (0) 212 / 320 1649
e mail: gts@turk.net

CSC Automation Ltd. **UKRAINE**
15, M. Raskova St., Fl. 10, Office 1010
**UA-02002 Kiev**
Phone: +380 (0) 44 / 238-83-16
Fax: +380 (0) 44 / 238-83-17
e mail: csc-a@csc-a.kiev.ua

## AFRICAN REPRESENTATIVE

CBI Ltd **SOUTH AFRICA**
Private Bag 2016
**ZA-1600 Isando**
Phone: +27 (0) 11/ 928 2000
Fax: +27 (0) 11/ 392 2354
e mail: cbi@cbi.co.za

## MIDDLE EAST REPRESENTATIVE

TEXEL Electronics LTD. **ISRAEL**
Box 6272
**IL-42160 Netanya**
Phone: +972 (0) 9 / 863 08 91
Fax: +972 (0) 9 / 885 24 30
e mail: texel_me@netvision.net.il

## EURASIAN REPRESENTATIVE

AVTOMATIKA SEVER **RUSSIA**
Krapivnij Per. 5, Of. 402
**RU-194044 St Petersburg**
Phone: +7 812 / 1183 238
Fax: +7 812 / 3039 648
e mail: pav@avtsev.spb.ru

CONSYS **RUSSIA**
Promyshlennaya St. 42
**RU-198099 St Petersburg**
Phone: +7 812 / 325 36 53
Fax: +7 812 / 325 36 53
e mail: consys@consys.spb.ru

ELEKTROSTYLE **RUSSIA**
Ul Garschina 11
**RU-140070 Moscowskaja Oblast**
Phone: +7 095/ 261 3808
Fax: +7 095/ 261 3808
e mail: —

ICOS **RUSSIA**
Industrial Computer Systems Zao
Ryazanskij Prospekt 8a, Office 100
**RU-109428 Moscow**
Phone: +7 095 / 232 - 0207
Fax: +7 095 / 232 - 0327
e mail: mail@icos.ru

NPP Uralelektra **RUSSIA**
Sverdlova 11a
**RU-620027 Ekaterinburg**
Phone: +7 34 32 / 53 27 45
Fax: +7 34 32 / 53 27 45
e mail: elektra@etel.ru

STC Drive Technique **RUSSIA**
Poslannikov Per. 9, str.1
**RU-107005 Moscow**
Phone: +7 095 / 786 21 00
Fax: +7 095 / 786 21 01
e mail: info@privod.ru